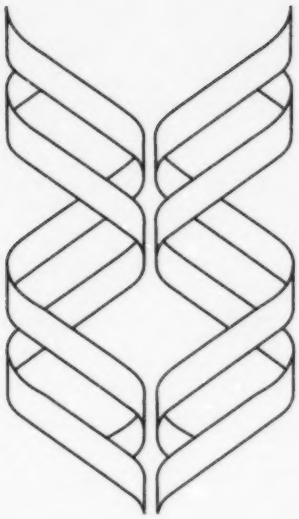
FARMING FOR THE FUTURE

PROGRESS REPORT

1991

Alberta

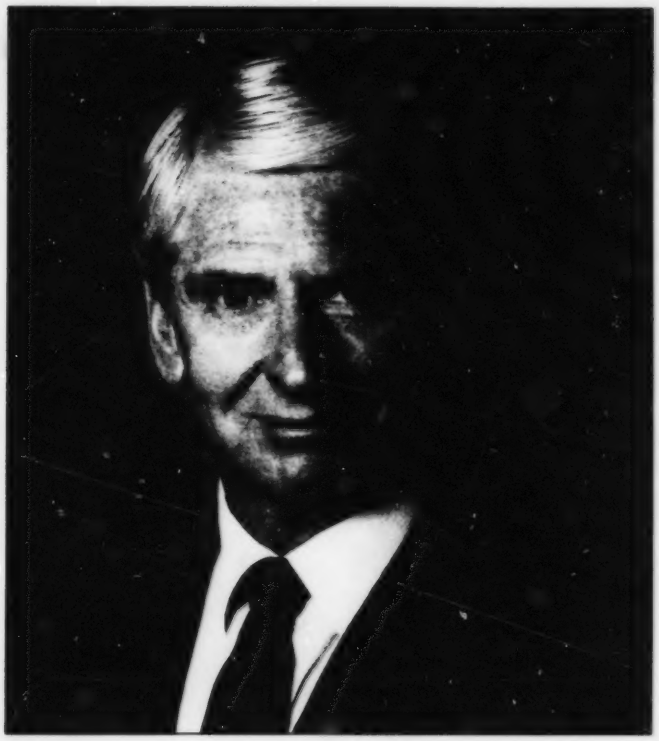
Farming for the Future Progress Report 92-05115/ 1991



Contents

Chairman's Report	2
Administration	4
Research Program	5
On-Farm Demonstration Program	13
Research Project Summaries	15
On-Farm Demonstration Project Summaries	23
On-Farm Demonstration Project Sites	29
Statistical Tables	30
Summary Schedule of Research Awards	32
Farming For The Future Council	33
Research Program Committees	34
On-Farm Demonstration Program Committees	35

Chairman's Report



I am pleased to present the 12th annual Progress Report of the Farming for the Future agricultural research program. This report covers the fiscal year April 1, 1990 to March 31, 1991, the fourth year of the program's third mandate.

The creation of the Farming for the Future Program was announced in 1977 to the Alberta Legislative Assembly by former Agriculture Minister Marvin Moore. In 1978, the Agricultural Research Council of Alberta (later known as the Farming for the Future Council) was designated as the governing body of the Program. In the following year, the Farming for the Future Program officially commenced funding of agricultural research.

The Farming for the Future Program was launched with a five-year mandate supported by funds from the Alberta Heritage Savings Trust Fund. The program was given a primary mandate of supporting research projects with the potential to improve net farm income and the long-term viability of agriculture in Alberta. Farming for the Future continues to pursue those objectives. Now in its thirteenth year of operation, the Program has proven itself worthy of renewed support.

As a testament to the resourcefulness of Alberta producers and processors, our agriculture and food industry retains a vital position in the province's economy. Science and technology play an increasingly important role in overcoming the complex challenges facing the agri-food industry. Farming for the Future's Research and On-Farm Demonstration Programs have been instrumental in meeting these challenges through discovery and practical application of more appropriate agricultural techniques. In its relatively short tenure, Farming for the Future has made numerous immediate and long-term contributions to the profitability and viability of agriculture in Alberta. The results include:

- Improved cereal and oilseed varieties adaptable to Alberta growing conditions.
- Diversification through alternative crop and livestock development.
- Innovative methods of soil and water conservation.
- Reduction of crop and animal diseases with safe and environmentally acceptable methods.
- Advances in cost-effective animal nutrition regimes.
- Development of value-added food products as well as packaging and preservation methods responsive to market demands.
- Identification of domestic and international market opportunities for Alberta's food and agricultural products.

From its inception until March 31, 1991, Farming for the Future has awarded a total of $51.5 million to 602 research projects and $3.8 million to 737 on-farm demonstration projects. The 1990-91 allocation to Farming for the Future was $5 million from the Alberta Heritage Savings Trust Fund. For this period, the Farming for the Future Council awarded $4 million in support of 110 research projects, selected from a total of 243 applications requesting a total of $11.2 million. Council also allocated $480,800 to 97 on-farm demonstration projects in 1990-91.

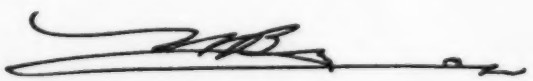
In 1987, the Alberta Agricultural Research Institute was formed as a crown corporation. It was given a mandate to coordinate, promote and support agricultural research and technology transfer. Since that time, the Institute's Board of Directors and the Farming for the Future Council have shown tremendous cooperation in pursuit of mutual goals. In order to streamline and further strengthen research coordination and funding efforts, Farming for the Future officially merged with the Alberta Agricultural Research Institute on April 1, 1991.

Farming for the Future has found an appropriate home in the Alberta Agricultural Research Institute. The merger was recommended by the Farming for the Future Council and received the full support of our Associate Minister of Agriculture, the Honourable Shirley McClellan. Under the auspices of the Institute, Farming for the Future's Research and On-Farm Demonstration Programs will continue their efforts towards those issues of utmost importance to Alberta's agriculture and food industry.

On March 27, 1991, the Farming for the Future Council held its historic final meeting. We are fortunate to retain the leadership of a number of former Council members, now serving on the Board of the Alberta Agricultural Research Institute. The Institute is also greatly benefiting from the expertise of former Farming for the Future committee members now serving on the Institute's restructured research and strategic committees. The on-farm demonstration committees retain their former structure under the Institute's Board of Directors. I wish to express my sincere appreciation to all members who have served on the Farming for the Future Council, research committees and on-farm demonstration committees for their valuable contributions to a highly successful program.

The imminent approach of a new century reminds us of the escalating role of science and technology in shaping the modern world. No field of endeavor can ignore the necessity of technological advancement in maintaining domestic and global competitiveness. This is particularly evident in the agriculture and food industries, where market vagaries, resource constraints and environmental concerns present additional challenges to researchers. Meeting these challenges can be greatly assisted by a strong research and technology transfer network.

The Alberta Government has repeatedly shown its long-term commitment to the research and development component of a viable agricultural industry. The creation of the Alberta Agricultural Research Institute is testimony to that commitment. The Farming for the Future Program is now part of the Institute, one of the leading research funding and coordinating organizations in Alberta. As a program of the Institute, I anticipate that it will achieve even greater success in the future.



H.B. (Ben) McEwen
Deputy Minister of Agriculture
Chairman, Farming for the Future Council
October 1991

Administration

Since its inception over a decade ago, Alberta Agriculture's Farming for the Future Program has provided invaluable resources in support of agricultural and food research in the province. The essential nature of research to agriculture has become more dramatic in today's rapidly changing marketplace. Farming for the Future has promoted intensive research and technology transfer projects directly beneficial to farmers and food processors.

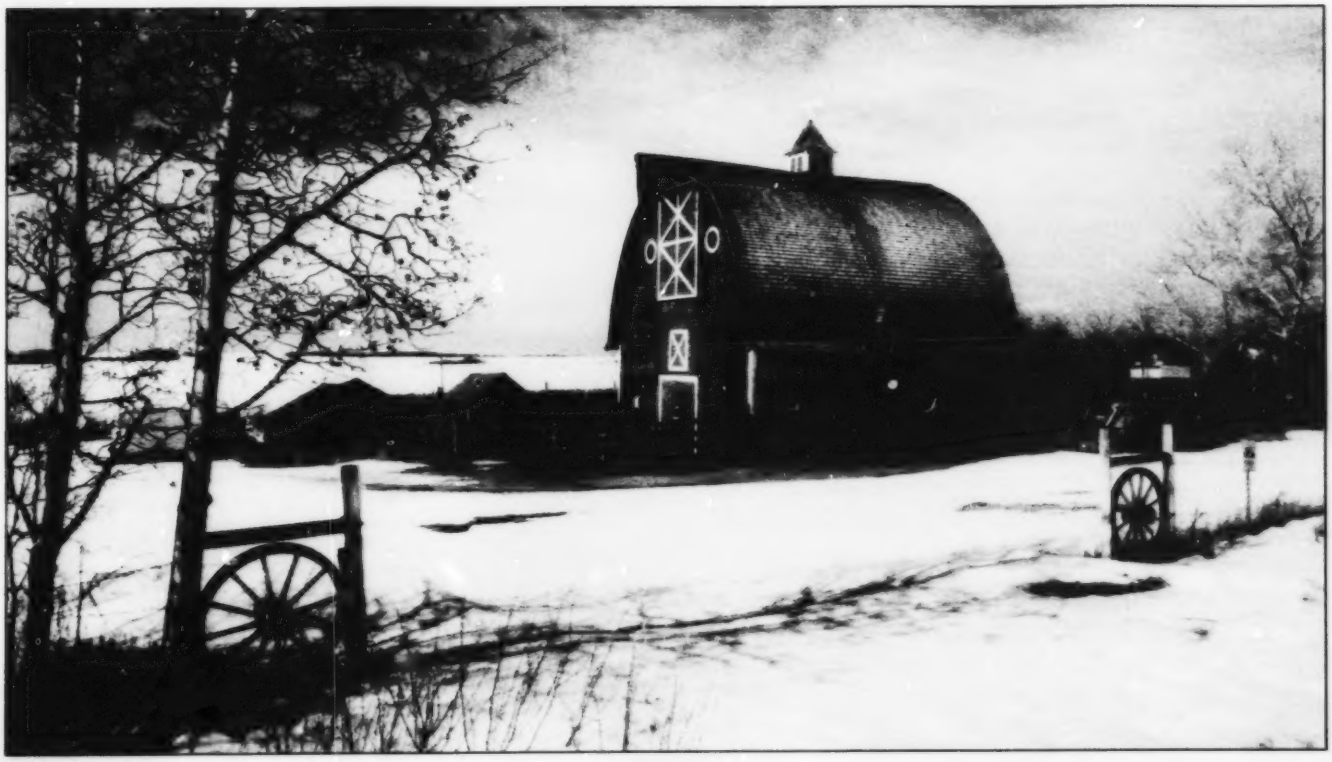
Farming for the Future began operation in 1979 as a research funding program. In 1982, the On-Farm Demonstration Program was incorporated to allow direct application of new research techniques to farming operations. Although the Research Program remains the major funding vehicle, the On-Farm Demonstration Program has greatly enhanced Farming for the Future's goals by bridging the gap between new technology and practical application.

Farming for the Future receives 100 percent of its funding from the Alberta Heritage Savings Trust Fund. The program has achieved outstanding success and continues to enjoy support from the Alberta Legislature and the scientific community. In total, the Research Program has allocated a total of $51.5 million to 602 projects between fiscal years 1979-80 and 1990-91. The On-Farm Demonstration Program awarded a total of $3.8 million to 737 projects since its beginning in 1982 until the end of fiscal year 1990-91.

The overall agenda of Farming for the Future has been directed by the Farming for the Future Council, chaired by the Deputy Minister of Agriculture, and consisting of producers and representatives of government and academic institutions. In addition to approving all expenditures, Council has ensured the program's goals have been met by establishing and monitoring policy and procedures. Fiscal year 1990-91 was another highly successful year for the Farming for the Future Program, during which approval was granted to a total of 110 research projects awarded $4 million and 97 on-farm demonstration projects funded by $480,800. The project selections were based upon careful review by various research and demonstration committees. In all cases, the main criterion for project selection was a clear potential for improvement and long-term sustainability of Alberta's agricultural industry.

The daily operations of the Farming for the Future Council and its programs were conducted by Alberta Agriculture's Research Division. One of the mandates of the Division is to disseminate program information, thus promoting awareness of Farming for the Future to the general public, researchers, farmers and the agricultural industry. During the past year, this mandate has been achieved through publication and distribution of the 1990 Farming for the Future Progress Report and several issues of Research Report, a popular newsletter highlighting program activities and projects of interest.

To facilitate technology transfer, additional updating was completed on the Ag-Research BBS, a computer-based bulletin board system and database. Introduced in 1989, the BBS offers a listing of abstracts from research and on-farm projects, and can be accessed by any interested person with a computer, modem and telephone.



Research Program

Introduction

The Research Program component of Farming for the Future represents the foundation of the program. Historically, research has received over 80 percent of annual project funding. Without high quality, coordinated research, the technology essential for advancing agriculture in Alberta would not be available.

The process for selecting and funding research projects begins with submission of research proposals from agricultural researchers to the Farming for the Future Council. The majority of the research proposals originate from universities and government research stations. A significant number of applications are also submitted by researchers from the private sector. All proposals are given a thorough evaluation on a yearly basis by various research program committees. Committee reviews are then forwarded to the Farming for the Future Council, which makes recommendations for a final decision on project funding by the Associate Minister of Agriculture.

Individual research program committees are established along commodity and discipline lines. In the 1990-91 fiscal year, nine committees were involved in assessing research proposals: cereals and oilseeds; forages; special crops; crop protection and entomology; land resources and engineering; irrigation; ruminants; non-ruminants; and processing and marketing. Committees are chaired by a producer Council member and consist of farmers and representatives of the research community with a wide range of expertise necessary for comprehensively critiquing each proposal.

Research projects are selected in accordance with a number of established criteria, including: perceived benefit to the agricultural and food industry; size, cost and duration; research design; and competence of the researcher. Both new and ongoing projects are awarded funds each year. In 1990-91, 53 new and 57 continuing projects were approved for funds totalling $4 million. Examples of these projects are mentioned in the following section and a brief description of all research projects supported in 1990-91 appears later in this report. Additional project information can be obtained by calling the Ag-Research BBS (403) 438-2209 (dataline).

A competitive food and agriculture industry is assisted by results from long hours of detailed laboratory investigation.

Crop Research

Cereals and Oilseeds

Cereals and oilseeds have always been a mainstay of Alberta agriculture. In 1990, estimated farm cash receipts for cereals and oilseeds were $1.38 billion, representing one-third of the total cash received by Alberta farmers. Over 95 percent of cereal and oilseed receipts were earned by wheat ($716 million), canola ($340 million) and barley ($271 million). Considering their importance to Alberta's economy, cereal and oilseed research addressing requirements specific to these Alberta crops is critical.

Recognizing the crucial role of these crops, Farming for the Future continues to support research aimed at improving cost-effective methods of cereal and oilseed production. In 1990-91, the program awarded $646,000 to 10 cereal and oilseed projects.

Most of the cereals and oilseeds research sponsored by Farming for the Future in the past year concentrated on developing or improving yields and disease resistance of canola and wheat. Several projects examined the adaptability and performance of these crops within varied climates and regions of the province. One Agriculture Canada project studied adaptation of canola varieties to two largely dissimilar areas: Peace River and southern Alberta. Biotechnology was utilized in another project as a method of improving winter wheat adaptability to cold conditions.

In recent years, interest has been demonstrated in a new approach to crop production. Intensive Crop Management (ICM), an innovative farming system utilized with success in Europe, optimizes all agronomic factors to increase yields, thus lowering unit costs. The past fiscal year saw the completion of a Farming for the Future project which evaluated an intensive management system for barley, wheat and canola. The project results indicated a potential for ICM to increase yields of wheat and barley with appropriate use of inputs.

Forages

Forages are those indigenous grasses and cultivated crops used to feed livestock. In 1990, the approximate on-farm cash equivalent of forages in Alberta was $850 million. They are of paramount importance to integrated agricultural production due to their active role in soil and water conservation, soil fertility and environmental protection. Realizing the contribution forages can make to profitable farming, the Farming for the Future Program allocated $214,000 to six 1990-91 research projects aimed at improving forage management and productivity.

The cost of raising livestock can be reduced by extension of the grazing season, thus decreasing the requirement for more expensive preserved forages. The first of two projects devoted to this concern studied the efficiency of managing rough fescue grasslands for grazing during the dormant season. A second project attempted to provide guidelines for intensive pasture management systems by researching the effect on productivity of grazing orchard grass cultivars in the fall.

Responding to the problem of inadequate pasture in Alberta between August and November, another innovative forage project evaluated the potential of a spring and winter cereal inter-crop (mixture) to increase late season pasture production. By extending the crop production period into the frost months of September and October, this technique could potentially decrease feed costs, reduce soil erosion and improve cattle condition entering winter. This project typifies the dependence of other agricultural commodities and resources on efficient forage crop management.

Agricultural profitability and sustainability are enhanced by development of efficient forage crop management practices.

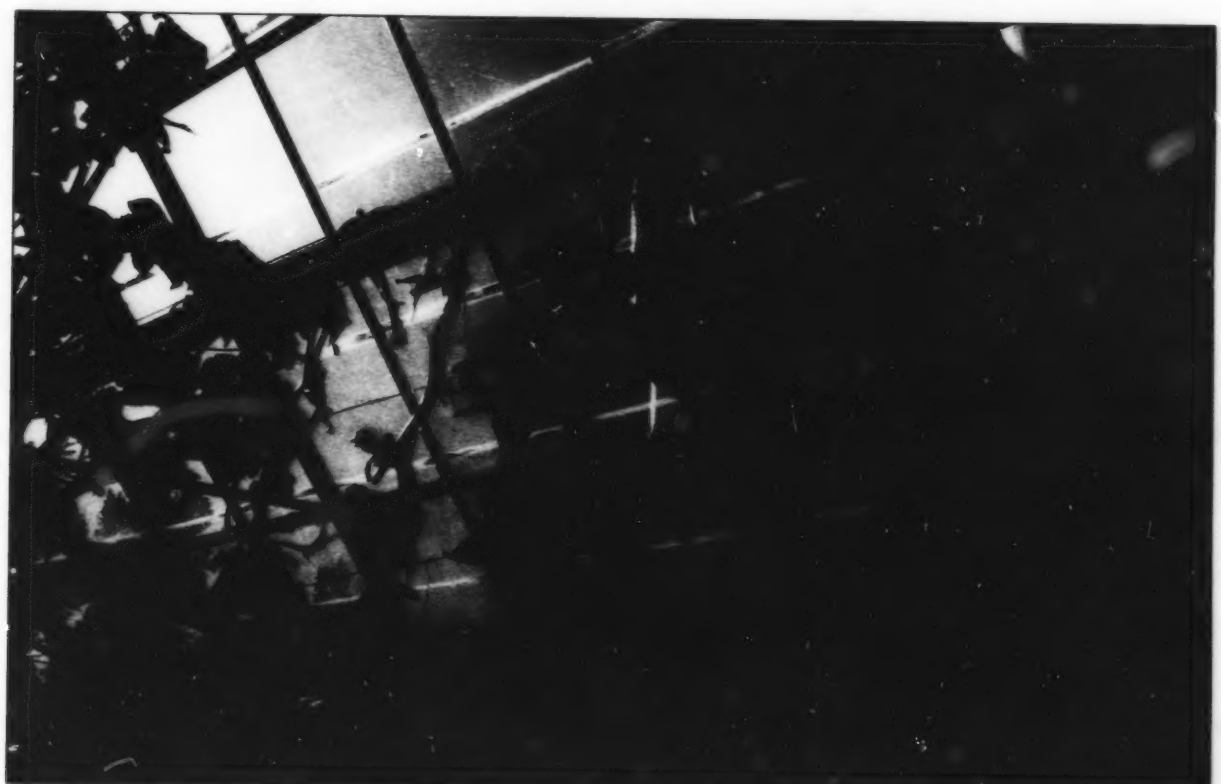
Alternative Crops

Alternative crops, sometimes referred to as special crops, encompass commodities other than traditional cereals, oilseeds and forages. In Alberta, important alternative crops are potatoes, sugar beets, vegetables (including greenhouse), pulses (peas, beans), safflower and ornamentals. Berries, wild rice, herbs, spices and essential oils have also made strides as special crops in Alberta.

Alberta farm cash receipts for alternative crops in 1990 were estimated at $207 million. As cash crops are not subject to quotas and unstable price structures, they present farmers a welcome option to increase net incomes. A number of these crops aid in soil conservation and fertility as well as offering alternative protein to livestock.

To compete with lower priced imports, ongoing research programs are required to discover methods for lowering the cost of alternative crop production. In the fiscal year 1990-91, Farming for the Future sponsored seven alternative crop projects with a total of $210,000. The projects centred on improving production techniques for such diverse products as potatoes, safflower, ornamental trees and herbs, spices and essential oil crops.

Long winters and short growing seasons are facts of life for Alberta farmers. Due to the limited availability of local vegetables year-round, greenhouse production of vegetables and ornamentals has grown dramatically in recent years. Much of the greenhouse industry in Alberta benefits from the availability of an ample supply of natural gas. Improving yield and controlling disease in nursery vegetables will further advance this industry and benefit consumers. A Farming for the Future project initiated in 1990 aims to increase yield and disease resistance in cultivars of greenhouse cucumbers by inoculation with a naturally occurring soil fungus that assists the plant in nutrient uptake.



Cost-effective production of greenhouse vegetables and other alternative crops create options for producers to increase net incomes.

Crop Protection and Entomology

As long as agriculture has existed, farmers have waged war on their nemesis: pests and diseases. Insects, weeds and pathogenic microorganisms are a perennial thorn in the side of profitable farming and each year exact a heavy toll on Alberta's agricultural industry. Although the weaponry of war against crop damage is much more sophisticated in the 1990s, researchers are constantly challenged to discover inexpensive, environmentally acceptable methods of pest control. Rapidly emerging new strains of pathogens, unpredictable weather patterns, cyclical pest populations and changing crop management techniques add to the research challenge of ameliorating hardship from crop damage.

The intensified use of genetic engineering appears to be one of the most appropriate responses to the challenge of crop protection in the future. It is clearly the most economical, efficient, long-term sustainable and environmentally acceptable method of controlling plant diseases. The use of biological agents has also been researched as an alternative, environmentally friendly method of crop protection.

In 1990-91, Farming for the Future awarded $647,000 to 15 crop protection and entomology projects. The projects were uniformly distributed among insect, weed and pathogen research. Two projects studied genetic engineering as a means of improving crop disease resistance. Using model plants, one of these projects examined the feasibility of genetic engineering and plant protein design to enhance insect and pathogen resistance. The benefits of this enhancement would create more nutritional, value-added crops; reduce or eliminate costly chemical treatment, thus improving the soil environment; and promote a better understanding of the molecular basis for plant disease.

Biological control of crop pests was also assessed in two projects during the past year. Pirate bugs, as predators of a major greenhouse cucumber pest (western flower thrips), were used in one experiment. The other examined the potential for stem-mining weevils to control Canada thistle, the most damaging perennial weed in cultivated and uncultivated agricultural land in Alberta. The weevils were also studied relative to their ability to act as vectors of the Canada thistle rust fungus.

The Russian wheat aphid (RWA) is a cold-tolerant insect pest of winter wheat in Alberta. One research project studied genetic transfer of RWA immunity from triticale to winter wheat.

Soil and Water Research

Land Resources

Sustainable agriculture connotes a sufficiency for existing natural resources to maintain and increase profitable levels of production over a prolonged period. Soil and water provide the underpinning essential to sustainability. Soil, in particular, is our most valued agricultural resource. Unlike water, which circulates and replenishes itself more quickly, soil lost via wind and water erosion is virtually irreplaceable ... less than geologic time spans. It has been estimated that the cost ... soil degradation to Albertans is a staggering $400 million each year. With new land suitable for farming scarce and existing land being removed from agriculture, it is necessary to promote scientific investigations that will lead to more responsible management of existing resources.

In 1990-91, Farming for the Future reaffirmed its strong commitment to sustainable agriculture by endorsing 14 research projects (total cost $482,000) devoted to resource conservation and agricultural engineering. A wide range of inventive procedures to minimize soil and water deterioration were explored. For example, one project utilized biotechnology in evaluating the potential for multi-crop systems to play a role in soil conservation. In a second project, super absorbent soil conditioning polymers were applied to fields in southern Alberta for the purpose of evaluating their moisture and soil retentive capability.

Irrigation

An adequate supply of quality water is an essential ingredient in any agricultural formula. In regions with limited annual rainfall, irrigation is required to maintain and improve productivity. Alberta had 1.1 million acres of land under irrigation in 1990, most of which are located in the semi-arid southern and south central areas where there is a long growing season and abundant sunshine. Although this represents only 4 percent of land suitable for cultivation in the province, irrigated agriculture accounts for 12 percent of farm cash receipts.

The Farming for the Future Program continues to fully support research projects aimed at improving the efficiency and environmental acceptability of irrigation systems in Alberta. In 1990-91, three irrigation research projects were granted awards totalling $98,000. Cost reduction of surge irrigation and potential irrigability in east central Alberta were studied in two separate projects. In the third project, soundwave transmission was investigated as a method of restricting the movement of beneficial weed-eating carp in irrigation canals.

Irrigation research projects supported by Farming for the Future examine methods of improving the efficiency and environmental acceptability of irrigation systems.

Livestock Research

Ruminants

Livestock production in Alberta anchors our agricultural industry. In 1990, farm cash receipts from livestock were $2.37 billion, representing 56 percent of total farm cash receipts. Cattle and calves maintained their status as the province's most valuable agricultural commodities in terms of their cash receipts, which totalled $1.56 billion in 1990 (37 percent of farm cash receipts). Dairy production was also a major player with milk and cream earning $251 million. Although sheep and lambs played a much smaller role in the ruminant group, their production contributes valuable diversity to Alberta agriculture.

Reaffirming the important position these products hold in our economy, the Farming for the Future Council approved funding of $786,000 for 21 ruminant research projects in the fiscal year 1990-91. Owing to the complex and multi-disciplinary nature of livestock production, various concerns were addressed by the research projects, including: disease prevention and treatment; animal nutrition; ruminant digestion; fertility; hormonal physiology; and pest control.

Prevention and treatment of costly diseases affecting feedlot cattle require intensive research efforts.

Substantial losses are incurred every year by the livestock industry from animal disease and nutritional deficiencies. Several ruminant projects examined these concerns in the past year. Bovine respiratory disease (BRD) is extensively documented as the most important ailment affecting feedlot cattle in North America. One Farming for the Future project focused on a usable technique for assessing the economic impact of this disease by measuring performance parameters. A second project examined BRD from the perspective of prevention with a genetically engineered vaccine.

Various methods of improving bovine nutrition were studied in 1990-91, including: the use of cereal silage for lactating dairy cows; canola oil treatment of grains; and neutral detergent fibre in dairy cattle diets. Changing consumer and retailer demand was a consideration in a project which evaluated the effect of diet on carcass leanness of market lambs.

Commercial production of game animals may be an important step towards diversification of the province's agricultural industry. Recent legislation has been introduced that, when enacted, would permit commercial production of game meat in Alberta. Domestication of a new species significantly advances agricultural knowledge. In support of efforts aimed at livestock diversification in the province, the Farming for the Future Council funded a research project in 1990 which studied energy requirements for wapiti.

Game farming diversifies and strengthens Alberta's agricultural sector. Pioneering research is crucial to this emerging industry.

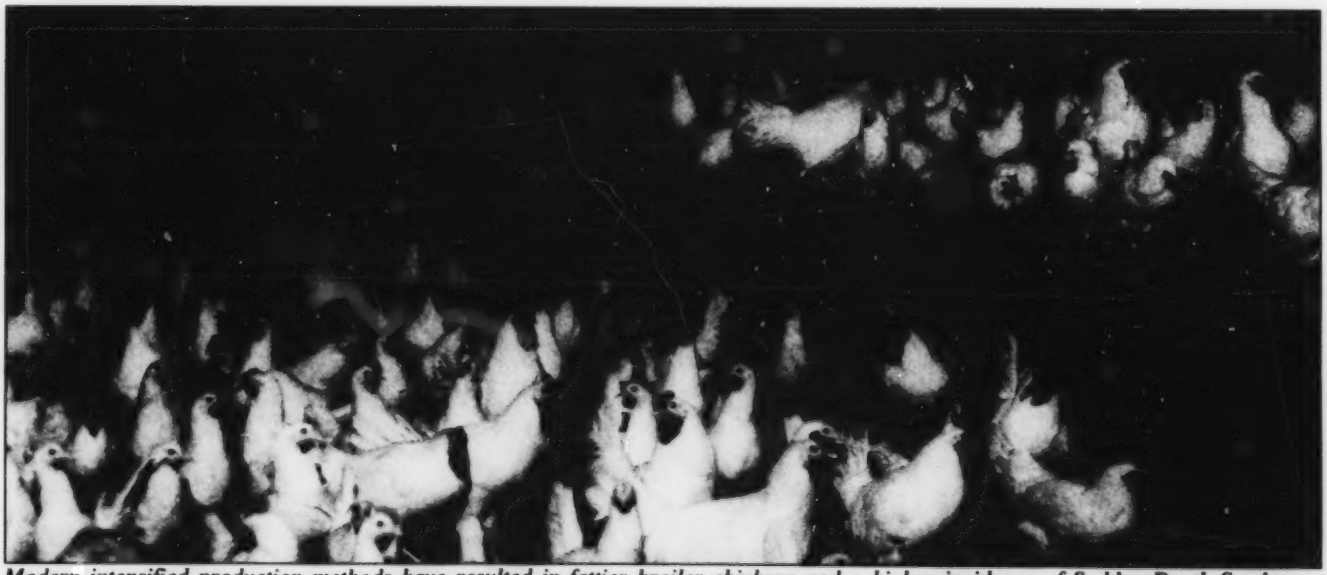
Non-Ruminants

In Alberta, the non-ruminant livestock industry primarily consists of swine and poultry. Farm cash receipts in 1990 for hogs were $299 million and $147 million for poultry and eggs. Horse meat production also represents a significant portion of the non-ruminant industry, with exports over $33 million in 1990. Production of other non-ruminants such as rabbits and goats is relatively minor.

Swine and poultry production constitutes a valuable component of Alberta's livestock industry. New production techniques arising from priority research may be beneficial to the overall advancement of these industries. In 1990-91, Farming for the Future supported 11 non-ruminant research projects with funds totalling $333,000.

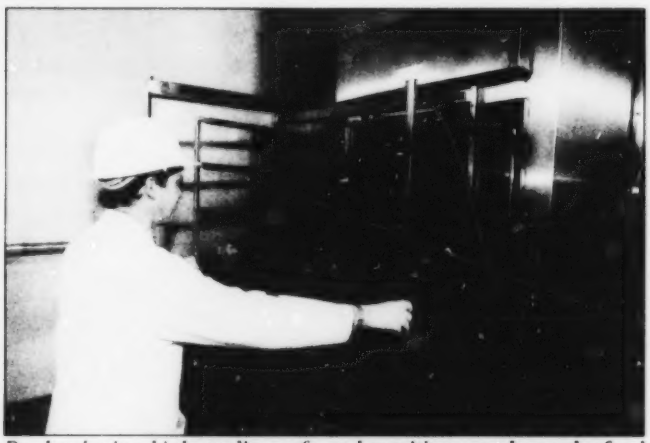
The relationship between animal nutrition and productivity was examined in various swine and poultry projects during the past year. In one project initiated in 1990, the researcher's objective was to develop a 'user-friendly' software package for improved understanding of sow nutrition and its effect on reproductive performance. This research exemplifies the growing trend towards the use of computers and other advanced technology in agriculture.

The broiler chicken industry has experienced recent success with increasing growth rates and feed efficiency. However, advancement does not usually occur without a price; in the case of the broiler industry, this intensified production has resulted in consumer resistance to fattier broilers and a higher incidence of broiler diseases. This downside formed the rationale of a 1990 Farming for the Future research project which studied the effect of feed restriction and photoperiod manipulation on broiler productivity.



Modern intensified production methods have resulted in fattier broiler chickens and a higher incidence of Sudden Death Syndrome. Researchers investigated feed restriction and photoperiod manipulation to minimize their occurrence.

Processing and Marketing Research



By developing high quality, safe and nutritious products, the food processing sector increases the value of Alberta's agricultural raw materials.

Agri-Food Processing

Processing raw materials into diverse finished products creates significant potential benefits for Alberta's agricultural industry. The agricultural processing sector has experienced tremendous growth in the past decade. In recent years, value of shipments from the province's food and beverage industry has kept pace with and exceeded total farm cash receipts.

To capitalize on domestic and international market demands, it is essential for Alberta's agri-food industry to supply products of the highest quality, safety and nutritional value. As a result of changing lifestyles and fluctuating consumer demand, the industry is also faced with the challenges of product diversification, environmental protection and development of new methods of food packaging and preservation. Increased knowledge and technology from research responsive to these challenges should facilitate the industry's goal of long-term competitiveness.

During 1990-91, the Farming for the Future Council approved funding of $292,000 to a total of 10 agri-food processing research projects. The research ranged from sensory evaluation of processed saskatoon berries to antibiotic detection in milk.

Beef was the subject in 4 projects, which examined parameters such as safety, shelf-life and organoleptic quality. One project utilized biotechnology to develop strains of lactic acid bacteria for shelf-life extension of meats. Shelf-life and quality are enhanced by proliferation of lactic acid bacteria, which inhibit spoilage and pathogenic bacteria. This research has evolved from the success with shelf-life extension of perishable foods packaged in a modified atmosphere favorable to lactic acid bacteria growth.

Marketing and Socio-Economics

Knowledge of the mechanisms that govern markets for agricultural products must be available if the goal of a competitive and profitable industry is to be maintained. Economics and marketing research helps in identifying trends and opportunities for building a successful agri-food industry.

A total of 12 marketing and socio-economics research projects were funded with $284,000 in 1990-91. Topics under investigation were diverse, ranging from a cost-benefit analysis of agricultural chemical use to an assessment of GATT implications for the Alberta farm sector. Under investigation in one project was the economic feasibility of replacing imported soybean meal, which costs the livestock industry $30 million annually, with Alberta produced canola and field pea 'mid-proteins'. Even a partial import replacement would create new cropping choices for producers and value-added products for processors. A second project studied the dynamics of cropping alternatives in Alberta dryland farming conditions. Productivity and soil erosion were examined in relation to traditional crop-fallow regimes.

Marketing research identifies market opportunities for Alberta's agricultural products.

On-Farm Demonstration Program

Farming for the Future's On-Farm Demonstration Program bridges the gap between research results and practical application of new agricultural techniques. Research is essential to the advancement of agricultural knowledge. The On-Farm Demonstration Program brings the research results down to earth by directly involving producers in evaluating new farming practices.

As a complementary extension of its Research Program, Farming for the Future's On-Farm Demonstration Program was implemented in 1982. From its inception to March 31, 1991, the Farming for the Future Council awarded a total of $3.8 million to 737 on-farm demonstration projects. The longstanding goal of the program has been expeditious transfer of practical technology to farmers.

The key to the program's success is cooperation. Alberta Agriculture extension personnel and researchers work with producers in the initial stage of project conceptualization and during the demonstration period. Technology transfer critical to long-term sustainability and profitability of the agricultural industry is enhanced by field days during which project sites are toured by other producers and extension personnel. The team approach has been remarkably successful in selection and completion of projects beneficial to individual farmers and the agricultural community.

Funding for on-farm demonstration projects may be requested by individual farmers, producer groups or applied research associations.

Each application is thoroughly reviewed by one of six regional committees, consisting of producers and Alberta Agriculture personnel. All applications are evaluated on the basis of their regional relevance, project design, project size and applicant experience. The committee recommendations are submitted to the Farming for the Future Council for final consideration.

The On-Farm Demonstration Program has compiled an impressive collection of success stories. A myriad of projects have incorporated practical methods of improved crop and livestock production aimed at cost reduction, diversification, resource conservation and environmental protection.

In the 1990-91 fiscal year, 97 on-farm demonstration projects (54 new, 43 renewed) were funded with a total of $480,800. A complete listing of projects and a map of project sites appears later in this report. The projects continued to reflect the positive direction farmers and researchers are taking towards immediate and long-term improvement of agricultural practices in the province. Examples of 1990-91 on-farm demonstration projects are highlighted below. Some of the projects emphasize regionally specific testing. However, others address farming concerns more universal in nature. For example, one province-wide demonstration project initiated in all six regions studied the effect of family expenditure management on farm productivity and will involve hundreds of farm families in Alberta.

- In Southern Alberta, producer groups examined the agronomics of alternative pulse and oilseed crop production. Soil management was also studied by a number of farmers and producer groups. One project utilized the technology of infra-red thermometry for determining crop irrigation requirements.
- In South Central Alberta, one project was aimed at changing consumers' perceptions towards beef quality as affected by meat aging and cooking. Computer technology was employed in another project which demonstrated the use of database as a dairy herd management tool. Coyote predation of sheep was the subject of a Region II project which examined electric fencing control.
- North Central Alberta was an active region for on-farm demonstration projects (26) in the past year. Several farmers examined alternative silage crops and methods of silage storage. Reflecting the recent interest in fortification of copper-deficient soils, two projects analyzed the effect of copper sulfate application on crop yield.
- In Northeast Alberta, soil conservation was the objective of two demonstration projects which evaluated the potential for legume crops to protect soil from wind and water erosion. The adaptability of field peas to this region's conditions was demonstrated in another project, which exemplified the province-wide interest in crop diversification.
- In Northwest Alberta, various aspects of water management were under study, including: the use of dugout water for cattle; forage irrigation with excess snow melt; and solar powered water pumping systems. One project studied various regimes for pasturing cow/calf pairs and another project demonstrated a vertical nuclei system for improved management of beehives.
- The Peace River area is one of the most important honey-producing regions in the world. In 1990, one on-farm demonstration project investigated honeybee overwintering. The value of other bees to this region was the subject of a project which demonstrated the role of leafcutter bees and bumblebees in crop pollination. Soil conservation by minimum tillage in a continuous cropping system was also examined.

The economic benefits arising from positive research results are not immediately evident to the general public. New knowledge and more efficient techniques must often be tested in the real world setting of the farm before their full impact on productivity and sustainability can be evaluated. Moreover, the regional implications of specific climates and soils in Alberta must be demonstrated before new practices are implemented.

Farming for the Future's On-Farm Demonstration Program is the prominent vehicle for practical affirmation of agricultural research in the province. Direct hands-on participation of producers and their families in the research and development process infuses energy into a committed plan of excellence for the farming sector. The spirit of industry and cooperation evident should contribute significantly to a brighter future for agriculture in Alberta.

Alberta has some of the most important honey-producing regions in the world. In an attempt to improve efficiency and self-sufficiency in the bee-keeping industry, one on-farm demonstration project examined a vertical nuclei system for overwintering honeybees.

Research Project Summaries 1990-91

Project Title and Objective	Project Manager	Institution and Location	Funding Awarded 1990-91
CEREALS AND OILSEEDS			
Breeding Regionally Adapted Canola Cultivars for Alberta Growing Areas • to develop high yielding, disease resistant canola cultivars adapted to the Peace River region and to southern Alberta	R.K. Downey	Agriculture Canada — Saskatoon	25,000
Evaluation and Development of Soft White Spring Wheats for Western Canada • to develop high yielding soft white wheats with good resistance to disease and sprouting	R.S. Sadasivaiah	Agriculture Canada — Lethbridge	75,000
Acceleration of Canola Variety Development for the Peace River and Southern Alberta Regions • to develop canola varieties adapted to the Peace River region and to irrigated dryland conditions in southern Alberta	D.L. Woods	Agriculture Canada — Beaverlodge and Lethbridge	195,000
Intensive Management Systems for Barley, Wheat and Canola Production • to determine the effects of fertilizers, plant growth regulators, pesticides and stand density on barley, wheat and canola yields	D.C. Penney J.H. Helm	Alberta Agriculture — Edmonton and Lacombe	72,000
Understanding and Alleviating Green Seeds in Spring Canola: Impact of Increased Early Frost Tolerance on Degreening • to assess frost tolerance during seed maturation in *Brassica napus*, *B. campestris* and *B. juncea* and to identify the superior lines	A.M. Johnson-Flanagan	University of Alberta — Edmonton	56,000
The Use of Microspore Culture to Evaluate Early Generation Hybrid Populations of *Brassica napus* • to test the microspore system for genetically stabilizing early flowering and disease resistant lines in early generations of hybrid *B. napus*	G.R. Stringam	University of Alberta — Edmonton	50,000
Genetic Sources of Herbicide Tolerance in Oats *(Avena sativa L.)* • to identify new sources of genetic resistance to five major wild oat herbicides, and to transfer these genes, through breeding and selection, to the genetic backgrounds of adapted Canadian cultivars	S. Kibite	Agriculture Canada — Lacombe	35,000
Rapid Development of Blackleg Tolerant *B. napus* Canola Cultivars Using Biotechnology • to collect and characterize a wide spectrum of virulent and avirulent isolates of blackleg which infect both Brassica and cruciferous weeds, and to develop a set of differentials to characterize the disease	G.R. Stringam	University of Alberta — Edmonton	61,000
***In vitro* Selection for Resistance to *Alternaria brassicae* in Canola** • to select lines of Polish and Argentine canola for resistance to blackspot caused by the fungus *Alternaria brassicae*, using *Alternaria brassicae* toxin as a selection pressure	J.P. Tewari	University of Alberta — Edmonton	50,000
Development of Winter Wheat Genotypes Resistant to Snow Molds and Low Temperatures • to adapt double haploid biotechnology using anther culture for breeding cold hardiness and snow mold resistance into new winter wheat lines for the central and northern prairies	D.A. Gaudet	Agriculture Canada — Lethbridge	27,000
CROP PROTECTION AND ENTOMOLOGY			
Quackgrass Control in Zero and Conventional Tillage Systems • to assess the effects of precisely timed, low rates of glyphosate (Roundup) and sethoxydum (Poast) on quackgrass control	K.N. Harker W.H. Vanden Born	Agriculture Canada — Lacombe and University of Alberta — Edmonton	56,000
Cultural and Chemical Control of Downy Brome in Winter Wheat • to determine the time of establishment and effect of soil moisture and temperature on emergence of downy brome in winter wheat, and to test potential herbicides for selective control of downy brome	R.E. Blackshaw	Agriculture Canada — Lethbridge	45,000
Feasibility of Long Term Grasshopper Management • to evaluate the use of bran baits treated with low quantities of insecticide or *Nosema locustae* in large areas to reduce grasshopper populations	M.G. Dolinski	Alberta Agriculture — Edmonton	53,000

Project Title and Objective	Project Manager	Institution and Location	Funding Awarded 1990-91
Economic Assessment of Cabbage Maggot Damage in Canola • to develop a system for measuring the economic impact of root maggots in canola by using exclusion cages	G.C.D. Griffiths	Griffiths & Griffiths Ecological Consultants — Sherwood Park	33,000
Detection and Identification of Virulent Strains of *Leptosphaeria maculans* (Blackleg) Using Monoclonal Antibodies • to produce monoclonal antibodies against the virulent strain of *L. maculans*, and to develop an enzyme-linked immunosorbent assay (ELISA) to rapidly detect and identify this fungus in canola and other plant tissues	R. Stace-Smith	Agriculture Canada — Vancouver	36,000
Influence of Crop Management on Control of Russian Wheat Aphid • to establish a set of management practices which will help moderate the damage done by the Russian wheat aphid	R.A. Butts	Agriculture Canada — Lethbridge	78,000
Genetic Engineering of Crop Plants for Enhanced Resistance to Insect Pests and Plant Pathogens • to determine the feasibility of using genetic engineering to enhance the resistance of crop plants to insect damage and invasion by pathogenic plant microorganisms	A.A. Szalay	University of Alberta — Edmonton	85,000
Evaluation of an Insect, *Ceutorhynchus litura*, as a Biological Control Agent for Canada Thistle • to assess the effectiveness of *C. litura* as a biological control of Canada thistle under field conditions and to test its ability as a carrier for Canada thistle rust disease	A.S. McClay	Alberta Environment — Vegreville	20,000
Evaluation of the Pirate Bug *Orius tristicolor* for Western Flower Thrips Control in Greenhouse Cucumbers and Peppers • to develop sampling procedures for and to evaluate the effectiveness of the pirate bug as a predator of western flower thrips in commercial greenhouse cucumber and pepper crops	M. Steiner	Alberta Environment — Vegreville	22,000
Developing Synthetic Resistance to Luteoviruses, Potato Leafroll, Beet Western Yellows and Barley Dwarf Viruses • to evaluate each of the genes of potato leafroll virus for their potential as synthetic resistance genes for the luteovirus class of plant viruses	R.R. Martin	Agriculture Canada — Vancouver	43,000
Improving the Efficiency of Complementary RNA Techniques for Diagnosis of Potato Viruses and Viroid • to improve techniques for detecting potato viruses by measuring the concentration of potato virus X and potato virus S with DNA probes using the dot-hybridization assay method	C. Hiruki	University of Alberta — Edmonton	32,000
Ammonium Sulfate and the Efficacy of POAST (Sethoxydim) • to define the environmental conditions under which the fertilizer ammonium sulfate can enhance the activity of the herbicide POAST against a range of weeds	W.H. Vanden Born	University of Alberta — Edmonton	18,000
Role of Alfalfa Leafcutter Bee Associated Microflora in Chalkbrood Disease • to determine the role of leafcutter bee associated microorganisms in chalkbrood disease	M.S. Goettel	Agriculture Canada — Lethbridge	44,000
Transfer of Russian Wheat Aphid Immunity From Triticale to Wheat • to identify the chromosome(s) involved in triticale's immunity to the Russian wheat aphid, and to transfer this immunity from triticale to wheat germ plasm suitable for use in wheat breeding programs	J.B. Thomas	Agriculture Canada — Lethbridge	44,000
Evaluation of Varietal Differences in Yield Losses Due to Barley Leaf Diseases • to assess under field conditions the disease resistance and yield loss due to barley leaf diseases of different barley varieties	S.W. Slopek	Alberta Agriculture — Olds	38,000
FORAGES			
Yield and Quality of Pasture Grasses During Initial Spring Growth and Fall Regrowth • to determine how plant maturity, structure and shape are related to the yield and quality of various pasture grasses	V.S. Baron J.R. King	Agriculture Canada — Lacombe and University of Alberta — Edmonton	34,000
Fall Management of Three Orchard Grass Cultivars Under Simulated Intensive Grazing • to evaluate how the timing of late-season grazing affects the winter hardiness and spring regrowth of three orchard grass cultivars	J.R. King	University of Alberta — Edmonton	33,000

Project Title and Objective	Project Manager	Institution and Location	Funding Awarded 1990-91
Assessment of Winter Grazing on Rough Fescue Grasslands • to determine the feasibility of winter grazing pregnant cows on rough fescue grassland in the foothills region of Alberta	W.D. Willms	Agriculture Canada — Lethbridge	44,000
Effect of Fall Cutting Date and Snow Cover on Time and Severity of Winter Kill in Orchard Grass • to quantify the winter hardiness of two types of orchard grass, 'Kay' and 'Mobite', and to devise an agronomic management package for their successful overwintering	J.R. King	University of Alberta — Edmonton	28,000
Salinity Tolerance of Forage and Turf Grasses • to develop agronomic management packages related to the salinity tolerance of 30 grass species grown in Alberta	R.C. McKenzie	Alberta Special Crops and Horticultural Research Centre — Brooks	35,000
Improving Late Season Forage Regrowth in Spring and Winter Cereal Intercrops • to determine the winter cereals best suited to intercropping with spring cereals in order to improve late season pasture production	V.S. Baron	Agriculture Canada — Lacombe	40,000
IRRIGATION			
Development of an Automated Cost-Effective Surge Irrigation System • to develop an automated surge-flow surface irrigation system to provide precise intermittent application of irrigation water, increase irrigation efficiency and save time	N. Foroud	Agriculture Canada — Lethbridge	28,000
Irrigation Suitability of Solonetzic Soil Associations in East Central Alberta • to evaluate the irrigation suitability of several types of solonetzic and chernozemic soils in east-central Alberta by studying potential forage production, soil salinity and sodicity under various irrigation management regimes	D.R. Bennett	Alberta Agriculture — Lethbridge	22,000
Evaluation of a Sonic Fish Barrier • to modify, evaluate and test a sonic device to replace costly and impractical fish barrier screens	R.J. Soar	Lambda Technology Ltd. — Victoria	48,000
LAND RESOURCES AND ENGINEERING			
On Site Biotechnologies for Soil Conservation and Risk Management on Luvisolic Soils • to develop cropping systems which conserve soil, are economically sound and use biological nitrogen fixation, where practical, to supply nitrogen	W.B. McGill	University of Alberta — Edmonton	38,000
Annual Legume Plowdown to Replace a Cultivated Fallow • to develop guidelines for the use of annual legume plowdown in order to maintain and improve soil nitrogen and organic matter levels	T.L. Jensen	Alberta Agriculture — Edmonton	48,000
Dryland Farming System Research for Southern and South Central Alberta • to develop an economic crop production system for the six soil areas in southern and south-central Alberta	R.H. McKenzie	Alberta Agriculture — Lethbridge	70,000
Maximizing Meadow Bromegrass Pasture Yield Through Optimum Nitrogen Fertilizer Management • to compare the efficiency of two nitrogen fertilizers (urea and ammonium) applied to meadow bromegrass in early spring, and to evaluate the influence of application time on efficiency	S.S. Malhi	Agriculture Canada - Lacombe	33,000
In-Bin Grain Moisture Monitoring • to test the feasibility of using soil moisture sensors to monitor the moisture content of grain in storage bins, and to establish whether the expansion/contraction of a grain mass can be used as a reliable indication of moisture content	J.J. Leonard	University of Alberta — Edmonton	8,000
Deep Tillage Tools for Soil and Water Conservation • to determine the effect of deep tilling on soil and water conservation, and to assess its long-term benefits	D.S. Chanasyk	University of Alberta — Edmonton	44,000
The Impact of Grazing on Rangeland Hydrology • to study the hydrologic impact of grazing on the sloped areas of the foothills fescue rangelands	D.S. Chanasyk	University of Alberta — Edmonton	42,000

Project Title and Objective	Project Manager	Institution and Location	Funding Awarded 1990-91
Management of Farm Dugouts as Water Supplies; Use of Lime for Algal Control • to develop a program for the use of lime to provide clean water in farm drinking water dugouts	E.E. Prepas	University of Alberta — Edmonton and Alberta Forestry, Lands and Wildlife — Peace River	28,000
Effect of Feeding, Flooring and Ventilation on Size and Character of Airborne Particles in Pig Housing • to study the behavior of airborne particles in an environmentally controlled room containing animals, pen partitions, feeders or slatted floors	J.R. Feddes	University of Alberta — Edmonton	43,000
The Pulse Bander: A Conservation Tool for Forage Production • to study the effect of pulse banding fertilizers into established grass cover in order to improve productivity and conserve soil moisture	M.J. Rowell	Norwest Soil Research Ltd. — Edmonton and Agriculture Canada — Lacombe	24,000
Effects of Super Absorbent Polymers on Soil Moisture Properties and Crop Yield • to determine the effects and economic benefits of several of the most effective polymers used to enhance soil moisture characteristics, and to determine the longevity of the polymers in the soil mixture	C. Chang	Agriculture Canada — Lethbridge	23,000
Amelioration of Soil Compaction Problems Through Appropriate Tillage • to determine the effects of soil compaction on: draft, fuel and energy requirements for different tillage and subsoiling practices; infiltration rate and runoff before and after tillage treatments; and to assess the cost effectiveness of ameliorative treatments	C. Chang	Agriculture Canada — Lethbridge	30,000
Zero and Conventional Tillage: Soil Organic Matter, Fate of Nitrogen, Crop Yield and Environmental Implications • to continue five long-term field experiments on yield and nitrogen uptake by adjusting the methods of tillage and the handling of straw	M. Nyborg	University of Alberta — Edmonton	33,000
Identification of Quality Criteria for Prairie Soils • to quantify the relationship between soil productivity and various specific, measurable soil properties	H.H. Janzen	Agriculture Canada — Lethbridge	18,000
NON-RUMINANTS			
Influence of Dietary Fat Level and Composition on Protein Deposition in the Rapidly Growing Broiler • to assess the effects of diets varying in the level and composition of dietary fat on net protein and energy gain, and to assess the underlying rates of protein synthesis and degradation	V.E. Baracos	University of Alberta — Edmonton	36,000
Effect of Immunization of Gilts Against Paternal Antigens on Reproductive Performance • to determine how pre-immunizing young gilts against antigens from boars affects conception rate, ovulation rate and embryo survival	R.J. Christopherson	University of Alberta — Edmonton	48,000
Post-Weaning Nutrition of the Pig: Nutrient Interactions Among Dietary Components • to determine the optimum levels of digestible protein, amino acids, fat and fibre in diets of early-weaned pigs	W.C. Sauer	University of Alberta — Edmonton	42,000
Nutritional Significance of Egg Yolk Biologically Enriched with Omega-3 Fatty Acids • to develop eggs and egg products biologically enriched with Omega-3 fatty acids by including full-fat canola, flax seed or fish products in laying-hen diets	J.S. Sim	University of Alberta — Edmonton	38,000
Evaluation of Full-Fat Canola and Barley in Commercial Broiler Diets • to compare high and low energy diets containing 60% Barlcan with conventional wheat/corn/soybean meal diets used in commercial production	R.E. Grimson	Lakeside Feeders Ltd. — Brooks	in progress
The Formulation of Pig Diets on the Basis of Digestible Amino Acid Supply • to determine the advantages of formulating swine rations on the basis of ideal amino acid digestibility values	W.C. Sauer	University of Alberta — Edmonton	22,000
The Evaluation of Vitamin E and Vitamin A in Horses • to investigate high pressure liquid chromatographic methods, normal blood plasma concentration and the influence of age on the status of vitamins A and E in horses	B.R. Blakley	Western College of Veterinary Medicine — Saskatoon	17,000

Project Title and Objective	Project Manager	Institution and Location	Funding Awarded 1990-91
A Practical Simulation Model of the Responses of Gestating and Lactating Sows • to develop software to model gestation and lactation in sows	B.A. Young	University of Alberta — Edmonton	47,000
Improving Broiler Chicken Production Efficiency Through Short-Term Feed Restriction and Photoperiod Management • to determine the efficiency of broiler chicken production by altering the growing environment	F.E. Robinson	University of Alberta — Edmonton	40,000
A Histomorphometric Study of the Skeleton of Broiler Chickens Kept Under Different Lighting Regimes • to identify any changes in broiler skeletons related to lighting programs or housing and which may correlate with a higher incidence of twisted leg syndrome	C. Riddell	Western College of Veterinary Medicine — Saskatoon	8,000
Detection of Stress Susceptible Pigs by Blood Marker Electrophoresis • to evaluate the potential for genetic blood markers to identify pigs subject to Porcine Stress Syndrome	A.C. Murray	Agriculture Canada — Lacombe	35,000
PROCESSING AND MARKETING			
Use of Biotechnology to Develop Innovative Systems for Preservation of Meats • to select and develop strains of bacteria that will inhibit spoilage and disease-causing bacteria in meats	M.E. Stiles	University of Alberta — Edmonton	38,000
Comparative Evaluation of Commercial Milk Coagulants for Increased Cheese Production Efficiency and Quality • to study the qualitative and quantitative proteolytic characteristics of milk clotting enzymes in commercial coagulants used in Alberta	F.H. Wolfe	University of Alberta — Edmonton	33,000
Macroeconomic Impacts on Canadian Agricultural Prices • to assess the impact of macroeconomic forces on prices paid by producers as well as on the prices they receive and the resulting impact on agricultural terms of trade	W.L. Adamowicz	University of Alberta — Edmonton	17,000
Analysis of Alberta Honey Composition to Aid Honey Exports • to establish quality factors in Alberta honey samples including detailed sugar composition, enzyme levels, the amino acid proline, ash levels and moisture and acidity	P. Sporns	University of Alberta — Edmonton	32,000
Economic Feasibility of International Trade in Feedgrains Between Alberta and the Northwestern U.S.A. • to assess the economic feasibility of exporting barley from Alberta to the U.S. given price and cost conditions characteristic of the 1980s	M.L. Lerohl	University of Alberta — Edmonton	16,000
Evaluation of the Capital and Credit Needs of Alberta Farmers • to develop a model to estimate capital and credit needs of Alberta farmers over the next five years	R.W. Ashmead	AgriTrends Research Inc. — Calgary	14,000
Frying Performance of Canola Fats and their Effects on Convenience Food Quality • to evaluate the frying performance of canola fats and commonly used frying fats, and to assess their effect on the quality of convenience foods using sensory, chemical and instrumental methods	Z.J. Hawrysh	University of Alberta — Edmonton	35,000
The Effects of Spray-Chilling on Beef Quality and Spoilage • to determine the effects of intermittent water sprays on carcass shrink and on muscle quality, purge loss and bacterial spoilage of boxed beef	G.G. Greer	Agriculture Canada — Lacombe	20,000
Estimation of Farm Equipment Depreciation With Market Data and Assessment of Related Investment Risk • to assess published information on depreciation rates and farm equipment prices, and to identify the types and risks of different farm equipment asset portfolios	G.A. Mumey	University of Alberta — Edmonton	13,000
An Analysis of Farm Structure in Alberta at a Sub-Provincial Level • to determine the physical and financial characteristics of Alberta's agricultural regions and how they relate to the policies and goals of the agri-food sector	W.J. Schissel	Alberta Agriculture — Edmonton	36,000
The Economics of Agricultural Chemical Use in Prairie Agriculture: Productivity and Environmental Impacts • to document the use of agricultural chemicals on the prairies, and to analyze the production, productivity impacts, social benefits and costs of increased chemical usage	T.S. Veeman	University of Alberta — Edmonton	39,000

Project Title and Objective	Project Manager	Institution and Location	Funding Awarded 1990-91
Sulfonamide Immunoassays for Antibiotic Screening of Milk • to develop antibody tests for sulfonamide residues in milk, and to study the reaction of sulfonamides with lactose	P. Sporns	University of Alberta — Edmonton	28,000
An Economic Analysis of Alternative Cropping Decision Models Under Uncertainty • to conduct an economic evaluation of alternative cropping systems under Alberta dryland farming conditions	L. Bauer	University of Alberta — Edmonton	25,000
Analysis of Risk and Returns in Hog Finishing • to generate information about investing in hog production	L. Bauer	University of Alberta — Edmonton	18,000
Canadian Agriculture and GATT: An Economic Analysis of Article XI • to analyze the economic effects on Canadian agriculture of provisions contained in Article XI of the General Agreement on Tariffs and Trade (GATT), and to document the historical evolution of selected proposals for change in the current provisions	M.M. Veeman	University of Alberta — Edmonton	27,000
An Economic Analysis of Risk Management Strategies for Alberta Beef Feeders • to provide an in-depth analysis of risks in cattle feeding and an analysis of techniques which may be useful in risk management	F.S. Novak	University of Alberta — Edmonton	25,000
The Effect of Dietary Vitamin E on Beef Quality and Shelf-Life • to determine the effect of dietary vitamin E on red color in beef cuts, and to evaluate the relevancy of this finding to both the cattle feeding and packing industries in Alberta	B.E. Thorlakson	Animal Research International — Airdrie	36,000
Flavor Quality Evaluations of Processed Saskatoon Berries • to evaluate, using sensory and instrumental methods, the effects of several commercial processing methods on the quality of saskatoon berry flavor	Z.J. Hawrysh	University of Alberta — Edmonton	23,000
Microbial Quality and Safety of Microwaved Beef Cuts • to determine the microbial quality of fresh meats cooked by microwave at different power levels, and to assess the safety of fresh meats inoculated with indicator bacteria and stored under conditions simulating good and abusive storage	M.E. Stiles	University of Alberta — Edmonton	17,000
Analysis of Commercial Barriers to Increase Domestic Utilization of Mid-Protein Feed Ingredients in Alberta • to characterize the market and distribution infrastructure on a regional and international basis for "mid-proteins", such as canola and cottonseed meal, grown in or imported into Alberta as feed ingredients	S.J. Campbell	AgriTrends Research Inc. — Calgary	36,000
Analysis of Production Costs for Farmer Owned Feed Manufacturing Facilities • to collect data on the total costs of operating producer-owned feed manufacturing plants in Alberta	A.W. Anderson	University of Alberta — Edmonton	18,000
Extension of Chilled Pork Storage Life to Facilitate Sea Transport to and Distribution Through Remote Markets • to determine the optimum carbon dioxide concentration which will allow maximum storage life for chilled pork	L.E. Jeremiah	Agriculture Canada — Lacombe	30,000
RUMINANTS			
Association of Respiratory Tract Colonization with Adherence of *Pasteurella haemolytica* -Al to Epithelial Cells • to determine if an association exists between colonization of the bovine respiratory tract by *Pasteurella haemolytica* and increased *in vitro* adherence of this bacterial species to bovine oropharyngeal epithelial cells	J.W. Costerton	University of Calgary — Calgary	25,000
Comparison of Natural Service Fertility of Yearling and Two-Year Old Bulls • to compare the fertility of bulls under different breeding pressures	M. Makarechian	University of Alberta — Edmonton	7,500
Development of a *Haemophilus somnus* Animal Model and Testing of Vaccine Components • to develop a challenge model in calves which accurately reproduces the clinical symptoms, pathological features and general disease progression of *H. somnus* infections as they are seen in natural field outbreaks, and to develop and test vaccines which would protect calves from developing *H. somnus* pneumonia and other *H. somnus* infections	H.G. Deneer	Veterinary Infectious Disease Organization — Saskatoon	39,000

Project Title and Objective	Project Manager	Institution and Location	Funding Awarded 1990-91
Viral Infection Dynamics in Pre-Weaned and Early Feedlot Beef Calves • to determine the time sequence or dynamics of natural individual and multiple concurrent viral infections (IBRV, PI_3, BRSV and BVDV) in post-weaned feedlot calves by low-impact serial serological testing	L.D. Armstrong	Alberta Agriculture and University of Alberta — Edmonton	40,000
The Role of Anaerobic Rumen Fungi in Cellulose Digestion and Animal Nutrition • to isolate the predominant rumen fungi found in ruminants fed a variety of common forage and/or concentrate diets, and to develop a profile of feed-dependent fungal colonization of ruminants in Alberta	K.-J. Cheng	Agriculture Canada — Lethbridge and University of Calgary — Calgary	60,000
Use of Neutral Detergent Fibre in Dairy Cattle Diet Formulation • to evaluate the effects of forage quality on the concentration of dietary neutral detergent fibre necessary to optimize rumen function and productivity of dairy cows	K.A. Beauchemin	Agriculture Canada — Lethbridge	45,000
Effects of Oil Treatment of Grains on Rumen Digestion and Animal Performance • to compare digestion of physically processed grain treated with specific levels of canola oil, and to assess the capacity of canola oil to alter the site of starch digestion in feedlot cattle	K.-J. Cheng	Agriculture Canada — Lethbridge	27,000
Immunological Selection of Adjuvants • to select substances which enhance immune response and are suitable for use in vaccines against cattle and swine respiratory diseases	M. Campos	Veterinary Infectious Disease Organization — Saskatoon	40,000
Bovine Respiratory Vaccine Development and Field Testing • to reduce economic losses caused by bovine respiratory disease (shipping fever) by developing better and more economical vaccines	L.A. Babiuk	Veterinary Infectious Disease Organization — Saskatoon	50,000
Simulation Modelling of Winter Stress and Feed Requirements of Cattle • to develop computer software which determines the nutritional and shelter requirements of cattle during Alberta winters	B.A. Young	University of Alberta — Edmonton	25,000
Energetic Efficiency of Wapiti • to determine how efficiently the energy available from seasonal native forages is used by wapiti for maintenance and weight gain	R.J. Hudson	University of Alberta — Edmonton	30,000
Is Cereal Silage a Viable Alternative to Alfalfa Silage for Lactating Dairy Cows? • to evaluate whole crop barley, oat and triticale silage as replacements for alfalfa silage in the rations of lactating dairy cows	J.J. Kennelly	University of Alberta — Edmonton	45,000
Chewing and Reticular Motility and Digesta Passage From the Rumen • to determine whether the amount of required chewing is the main factor limiting the voluntary feed intake of individual cattle fed lower quality rations	G.W. Mathison	University of Alberta — Edmonton	36,000
A Proposal to Investigate the Economic Impact of Respiratory Disease in the Feedlot • to develop an assessment package for the economic impact of bovine respiratory disease (shipping fever) in the feedlot, and to determine the physical and economic performance of calves treated for an early fever	G.K. Jim	Feedlot Health Management Services — Okotoks	50,000
Nutritional Strategies to Promote Lean Growth of Lambs • to determine the effects of dietary protein and energy on the growth, wool production and carcass characteristics of lambs	K.A. Beauchemin	Agriculture Canada — Lethbridge	40,000
Physical and Chemical Factors Regulating Forage Intake and Digestibility by Ruminants • to determine the inter-relationship between various chemical and physical characteristics and voluntary intake and digestibility, and to develop simple laboratory analyses of detergent fibre as a predictor of the nutritive value of forages	L.M. Rode	Agriculture Canada — Lethbridge	40,000
Relationship Between Body Size, Body Condition and Fat Reserves in Beef Cows • to determine the relationships between tissue fat reserves, body condition and winter feed requirements of Continental- and British-type cows in order to help develop a practical feeding system for wintering beef cows	L.M. Rode	Agriculture Canada — Lethbridge	40,000
Hormonal Manipulation in Calves to Improve Their Growth Rate • to determine if immunizing calves against somatostatin enhances their growth rate and feed utilization efficiency, and to study the hormonal mechanism changes caused by this immunization	G.J. Mears	Agriculture Canada — Lethbridge	45,000

Project Title and Objective	Project Manager	Institution and Location	Funding Awarded 1990-91
Development of Integrated Pest Management for Stable Flies in Drylots • to develop integrated pest management guidelines for the stable fly based on its seasonal changes in population density, attack rates, resting sites and breeding sites	T.J. Lysyk	Agriculture Canada — Lethbridge	45,000
Zinc Metallothionein • to determine zinc levels in animal blood by developing procedures to perform reverse phase liquid chromatography and atomic absorption spectrophometry, thereby assisting veterinarians and nutritionists to evaluate the necessary level of dietary zinc	B.E. Beck	Alberta Agriculture — Edmonton	17,000
Preslaughter Stress in Cattle II: Management of Preslaughter Stress to Improve Carcass Yield and Grade in Beef Cattle • to use preslaughter electrolyte treatments along with measurements of blood in market weight cattle to identify and treat preslaughter stress	A.L. Schaefer	Agriculture Canada — Lacombe	30,000
Effect of Meningeal Worm on Domestic Sheep • to determine the potential for domestic sheep to become infected with and transmit meningeal worm	W.M. Samuel	University of Alberta — Edmonton	20,000
SPECIAL CROPS			
Safflower Management for Optimizing Yield and Quality • to evaluate safflower management techniques in order to prepare a detailed safflower production package	H.H. Muendel B.A. Roth	Agriculture Canada — Lethbridge and Alberta Agriculture — Lethbridge	61,000
Adaptability and Agronomic Practices of Herbs, Spices and Essential Oil Crops for Alberta • to determine agronomic practices for commercial production of herbs and spices in Alberta	R.G. Gaudiel	Alberta Special Crops and Horticultural Research Centre — Brooks	25,000
Salinity and Cold Tolerance of Ornamental Trees • to develop reliable recommendations under field conditions for salinity and cold tolerance of several species of trees and shrubs grown in Alberta	R.C. McKenzie	Alberta Special Crops and Horticultural Research Centre — Brooks	17,000
Overwintering Container Stock: How Dormancy Relates to Root and Shoot Cold Hardiness • to characterize factors controlling root hardiness, and to determine the relationship between dormancy and cold hardiness	H.M. Mathers	Alberta Special Crops and Horticultural Research Centre — Brooks	500
Commercial Adaptability, Feasibility and Management Practices of Selected Essential Oil and Spice Crops in Alberta • to evaluate and determine the commercial adaptability of spice crops using commercial equipment for establishment, maintenance, harvesting and processing operations	R.G. Gaudiel	Alberta Special Crops and Horticultural Research Centre — Brooks and Alberta Agriculture — Lethbridge	39,000
Increasing the Yield of Field and Greenhouse Cucumbers With Mycorrhizal Fungi • to determine the extent to which vesicular-arbuscular mycorrhizal (VAM) fungi can be used to enhance the growth, development and yield of greenhouse and field-grown cucumbers	N.R. Knowles	University of Alberta — Edmonton	40,000
Irrigation Management Profiles for Potato Cultivars Grown in Southern Alberta • to develop irrigation management schemes for potato cultivars currently and potentially important to the potato industry in southern Alberta	D.R. Lynch	Agriculture Canada — Lethbridge	27,000

On-Farm Demonstration Project Summaries 1990-91

Project Title and Objective	Principal Cooperator/ *Project Location*	Project Coordinator/ *Office*	Funding Awarded 1990-91
REGION I - SOUTHERN ALBERTA			
Field Verification of Innovative Alternative Crop Production Techniques • to assess the production of safflower, sunflower, pulses, corn and spices	Alberta Pulse Growers Commission *Lethbridge*	Blair Roth *Lethbridge*	16,415
Solonetzic Soil Improvement • to assess the use of manure to improve soil structure and fertility	Bill Van Rootselaar *Fort McLeod*	Brian Laing *Claresholm*	900
Field Implementation of Infra-Red Thermometry Technology for Scheduling Irrigation • to train farmers and industry in the techniques of determining baselines from which they can calculate a crop water stress index	Alberta Corn Committee *Lethbridge*	Blair Roth *Lethbridge*	17,380
Irrigated Alfalfa Fertility Trial • to determine yield response of irrigated alfalfa to nitrogen, phosphorus and potassium fertilizers	Gross Brothers *Bow Island*	Ken MacPhail *Bow Island*	1,567
Intensive Safflower, Mustard and Flax Agronomy Program for Southern Alberta Conditions • to evaluate and display the agronomic practices and economic results of growing alternative oilseed crops	Alberta Safflower Growers Association *Lethbridge*	Blair Roth *Lethbridge*	20,000
The Potential for Upright Dry Beans in Southern Alberta • to introduce the cultivation of upright beans and compare agronomic practices with conventional vineytype varieties	Alberta Pulse Growers Commission *Lethbridge*	Blair Roth *Lethbridge*	19,090
Black Spring Ridge Salinity Control Implementation Using Salt Tolerant Grasses • to demonstrate a variety of effective management tools to control soil salinity in a small drainage basin	George Sevco *Barons*	Dennis Stretch *Vulcan*	2,720
Black Spring Ridge Salinity Control Implementation Using Salt Tolerant Grasses • to demonstrate a variety of effective management tools to control soil salinity in a small drainage basin	Roy McLeod *Carmangay*	Dennis Stretch *Vulcan*	2,720
Rooting Depth and Water Use of Ten Different Varieties of Alfalfa • to determine rooting depth, water use and ability to control dryland salinity in ten alfalfa cultivars under southern Alberta conditions	Don Welsh *Milk River*	Don Wentz *Lethbridge*	23,683
Pelvic Area Measurements as Criteria for Culling Replacement Beef Heifers • to determine if pelvic area measurements taken before breeding, during mid-pregnancy and before calving can be used to predict calving difficulty	Byron Templeton *Coaldale*	Dwight Karren *Lethbridge*	4,723
Farm Family Expenditures • to demonstrate separate farm business and family/household record keeping procedures	Laura Marie Doenz *Warner*	Jan Williams *Brooks*	3,090
Changing Consumers' Perceptions About Pulses • to assist producers in promoting pulse crops to the public and relating information on varieties, preparation and the use of pulses in consumers' diets	Alberta Pulse Growers Commission *Bow Island*	Brenda Lea MacPhail *Foremost*	9,005
REGION II - SOUTH CENTRAL ALBERTA			
Effect of Supplemental Protein Meal on Gain of Nursing Calves • to evaluate the benefits and economic feasibility of feeding supplemental protein meal to nursing calves on pasture	Chinook Applied Research Association *Oyen*	John Ruschkowski *Oyen*	3,271
Mortality and Its Causes on Commercial Broiler Farms • to determine the cause of death in broiler chickens over an entire production cycle	Sungaard Poultry *Standard*	Rod Chernos *Airdrie*	564
The Effect of Improved Air Quality on Broiler Chicken Performance • to define carbon dioxide concentration for better air quality and broiler chicken performance	Country Lane Farms Ltd. *Strathmore*	Rich Smith *Airdrie*	5,175
Evaluation of Sheep Covers Under Alberta Conditions • to assess the economics, practicality and benefits of sheep covers	Ken and Val Slemko *Strathmore*	Scott Meers *Strathmore*	789

Project Title and Objective	Principal Cooperator/ *Project Location*	Project Coordinator/ *Office*	Funding Awarded 1990-91
Toadflax Control with Fallow and Herbicides • to demonstrate chemical and cultural methods of controlling toadflax	Laycraft Farms Ltd. *Blackie*	Allen Toly *High River*	465
Integrated Beef and Sheep Production • to demonstrate the low cost modification of existing beef facilities to accommodate both an intensive sheep production enterprise and a beef cattle enterprise	Marilyn & Ed Verweire *Strathmore*	John Portail *Strathmore*	1,440
Use of Nitrogen on Native Pasture to Improve Production and Utilization • to demonstrate the use of nitrogen on native pasture to improve production	Stan Richmond *Rumsey*	Don Poisson *Drumheller*	1,615
Sprigging Demo with Four Grass Species • to demonstrate sprigging (planting vegetative parts) of four grass species for soil reclamation purposes	Duckworth Farms *Calgary*	Don Wentz *Airdrie*	1,850
Increasing Consumer Acceptance of the New Alberta Beef • to enhance consumers' perceptions of beef quality	Steer-A-Year Committee *Strathmore*	Maureen Bolen *Strathmore*	2,725
Feeding of Condor Barley to Broiler Chickens • to assess the use of Condor barley as a suitable replacement for corn and wheat in poultry rations	Steven Mudge *Strathmore*	Brenda Ralston *Calgary*	6,158
Using Early Maturing Seeded Grasses to Allow Complementary Grazing of Native Range • to demonstrate the use of alternate early tolerant grass species for deferred grazing of native grasses in the spring	Jim Hughes Jr. *Longview*	Allen Toly *High River*	2,374
Field Pea Variety Testing and Agronomic Study • to demonstrate ten field pea varieties	Alberta Pulse Growers Commission *Innisfail*	Neil Miller *Lacombe*	2,662
Sprigging Demonstration • to assess the technical and economic practicality of sprigging grass rhizomes to reclaim problem soils	Harold Henzlmeir *Strathmore*	Scott Meers *Strathmore*	1,100
Application of Zinc and Copper to Hayland • to determine if the addition of copper and zinc to forage crop land will eliminate the need for supplemental mineral feeding of cattle	Larry McLeod *Bowden*	Ron Woolf *Olds*	800
A Field Trial of an Electronic Animal Identification System in Beef Cattle • to determine if an electronic animal identification system is functional within the management systems for beef cattle in Alberta	Barry Hilton *Strathmore*	Dr. Jane Pritchard *Airdrie*	7,200
Canola Productivity Centre Pilot Project • to demonstrate both new and proven canola production practices	Alberta Canola Producers Commission *Acme*	Jeff Millang *Three Hills*	9,748
Automatic Egg Gathering System for Turkey Breeders • to construct and test an automatic egg gathering system, as measured by labour requirement and egg quality, for a turkey breeding barn	Sylvester Mertz *Calgary*	Rich Smith *Airdrie*	4,625
The Use of Growth Implants in Replacement Beef Heifers • to determine the effect of a beef heifer growth implant on growth rate, conception rate, calving difficulty and milk production	John and Evelyn Pekse *Sundre*	Ron Woolf *Olds*	1,160
Demonstration of DHI Electronic Data Transfer and the Use of Specialized Herd Monitor Software • to develop and demonstrate the Dairy Herd Improvement (DHI) database, commercial monitor software and computer modem electronic data transfer technology as an effective dairy herd management tool	Joe Zink *Calgary*	Dennis Lowry *Airdrie*	11,433
Farm Family Expenditures • to demonstrate separate farm business and family/household record keeping procedures	Wendy Mikkelsen *Langdon*	Kathy Lowther *Airdrie*	4,160
Adapting New Fencing Techniques to Control Coyote Predation in Alberta Sheep Pastures • to determine the optimum electric fence wire spacing, lower strand height requirements and the effectiveness of bipolar vs unipolar electric fencing for controlling coyote predation in sheep pastures	Bill Bancroft *Cochrane*	Barb Archibald *Airdrie*	2,248

Project Title and Objective	Principal Cooperator/ *Project Location*	Project Coordinator/ *Office*	Funding Awarded 1990-91
REGION III - NORTH CENTRAL ALBERTA			
Field Pea Variety Testing and Agronomic Study • to provide producers with information that will allow them to choose pea varieties best suited to their local areas	Central Alberta Branch, Pulse Growers Commission *Camrose*	Neil Miller *Lacombe*	785
Special Crops Project • to demonstrate the success of alternate cash crops	Battle River Applied Research Association *Camrose*	David Samm *Camrose*	5,023
Perennial Forage Establishment Demonstration • to demonstrate and compare various establishment techniques for a crested wheatgrass/alfalfa mixture	Chinook Applied Research Association *Oyen*	Jeff Millang *Coronation*	4,808
Maintaining a Legume Stand by Annual Overseeding • to determine if annual overseeding of a legume into an existing stand can aid in maintaining the legume component of the stand	Grey Wooded Forage Association *Rocky Mountain House*	Ken Ziegler *Rocky Mountain House*	2,500
Repair of Chemically Eroded Milkhouse Floors by Using Different Sealers • to assess the effectiveness (durability and ease of cleaning) of sealers used to repair chemically eroded milkhouse floors	Harry Ekkel *Lacombe*	Ross Smith *Red Deer*	300
Evaluation of Nutra-Shield as an Alternative to Plastic and No Cover for Preserving Fababean/Barley, Field Pea/Barley Silage • to evaluate Nutra-Shield silage cover relative to handling, silage storage, sealing properties and economics	Donna McMurtry *Innisfail*	Grant Lastiwka *Innisfail*	1,130
Condor Barley as a Wheat Replacement in Hog Starter and Grower Rations • to test the market for an improved naked barley variety as a substitute for wheat in hog rations and to test a barley/pea mixture for hog starter rations	Condor Barley Group *Clive*	Neil Miller *Lacombe*	2,819
Alternative Oilseeds Project • to investigate the agronomic potential of flax, safflower, sunflower, mustard and mustard/canola as alternative oilseed crops for east central Alberta	Battle River Applied Research Association *Camrose*	David Samm *Camrose*	6,007
Use of Peat to Control Odour from Hog Manure Lagoons • to evaluate the use of peat to control odour and limit ammonia volatilization from lagoons containing liquid hog manure	Don Gregorwich *Kelsey*	David Samm *Camrose*	5,134
Evaluation of Production from Rotationally Grazed Pasture • to assess cattle performance on rotationally grazed pasture in west central Alberta	Beverly Siegel *Buck Lake*	Ron Koots *Rimbey*	3,635
Ensiling Potential of Various Crops in West Central Alberta • to evaluate various silage crops as alternatives to traditional haying practices	Brian Kriz *Rimbey*	Ron Koots *Rimbey*	2,010
Market Improvement of Alberta Lamb Through Out of Season Breeding Using Uterine Sponge • to assess the effectiveness of the uterine sponge technique in spreading the breeding and lambing season in Alberta flocks	Tom Eggertson *Lousana*	Ted Nibourg *Red Deer*	2,010
Surface Wrap versus Covered Hay • to evaluate the quality retention, feed acceptance and cost of wrapped and/or covered large round bales	Neil Handford *Ponoka*	Brian Cameron *Ponoka*	2,111
Wetaskiwin Silage Variety Trial • to demonstrate the quality, yields and agronomic traits of various silage crops and silage crop mixes	Marvin Ruff *Millet*	Bruce Friedel *Wetaskiwin*	1,400
Effect of Supplemental Protein Meal on Gain of Nursing Calves on East Central Alberta Pasture • to evaluate the benefits of feeding supplemental protein meal to nursing calves on pasture	Chinook Applied Research Association *Oyen*	Jeff Millang *Coronation*	4,251
Sprigging Demo on Bathtub-ring Saline Seeps with Four Grass Species • to demonstrate sprigging of high-moisture grasses to control bathtub-ring salinity and to promote sprigging as a viable technology for dryland salinity control	Round Hill Agricultural Society *Round Hill*	Dr. Jim Miller *Lethbridge*	5,500

Project Title and Objective	Principal Cooperator/ *Project Location*	Project Coordinator/ *Office*	Funding Awarded 1990-91
Combination Recirculation-Exhaust Ventilation in a Relatively Small Grower Barn • to demonstrate the benefits of an improved hog barn ventilation system	New Horizon Hog Farm *Lacombe*	Robert Borg *Red Deer*	750
Applying Copper Sulfate on Copper Deficient Soils to Increase Grain Yields • to evaluate the agronomic and economic effects of copper sulfate addition to soil	Mike Ammeter *Sylvan Lake*	Ted Nibourg *Red Deer*	912
Volunteer Crop Control Demonstration Using Canola, Wheat and Barley • to demonstrate the effectiveness and mode of action of herbicides used to control volunteer cereals in canola crops and to control volunteer canola in cereal crops	Camrose Crop Club *Camrose*	David Samm *Camrose*	2,580
Evaluation of Wind Erosion Traps for Soil Conservation Research and Demonstration • to design and build soil wind erosion traps following two prototypes	Battle River Applied Research Association *Camrose*	David Samm *Camrose*	3,441
Yield Response of Barley and Wheat to Copper Sulfate • to determine the agronomic potential of using copper sulfate as a fertilizer on wheat and barley in east central Alberta	Battle River Applied Research Association *Camrose*	David Samm *Camrose*	752
Wapiti Creep Feeding Trial • to determine if creep feeding elk calves improves fall weaning weights and to evaluate a high energy creep feed	Cree Valley Game Farm *Westerose*	Bruce Friedel *Wetaskiwin*	3,770
Forage Crop Micronutrient Trial • to demonstrate the response of alfalfa to sulfur, copper and boron by foliar spray applications and comparative soil banded granular applications	Ken and Rob Ball *Wetaskiwin*	Bruce Friedel *Wetaskiwin*	3,211
Farm Family Expenditures • to demonstrate separate farm business and family/household record keeping procedures	Marilyn Sharp *Lacombe*	Joyce Lencucha *Red Deer*	5,140
The Effect of Two Levels of Electrolyte Supplementation on the Growth Performance of Incoming Feeder Calves • to determine the effect of two levels of electrolyte supplementation on calf growth performance, morbidity and mortality	Ian Stewart *Bittern Lake*	George Rock *Camrose*	5,050
REGION IV - NORTHEAST ALBERTA			
Efficacy of Using Pelvic Area Measurements as Criteria for Culling Replacement Heifers • to determine if pelvic area measurements can be used to predict calving difficulty, and thus be used as practical culling tools	Tofield Beef Club *Tofield*	Tennis Marx *Ryley*	347
Maximum Economic Yield Demonstration Project • to determine the economics of fungicide and plant growth regulators applied to barley on normal and high fertility regimes	Ken Rempel *Tofield*	Tennis Marx *Ryley*	4,503
Soil Conservation and Improvement - Alternatives to Conventional Summerfallow • to demonstrate methods of preventing soil erosion and the use of legume crops to improve long-term soil productivity	Mark Perkins *Wainwright*	Grant Gillund *Wainwright*	360
Erosion Prevention and Soil Improvement - Alternatives to Conventional Summerfallow • to demonstrate methods of protecting soil from wind and water erosion, to determine the effects of Indian Head lentils on long-term soil productivity and to evaluate the economics of these alternatives to conventional summerfallow	Mark Perkins *Wainwright*	Grant Gillund *Wainwright*	400
Banding vs Broadcasting Fertilizers on Pasture • to demonstrate banding vs broadcasting of nitrogen, phosphorus and potash and to demonstrate the rejuvenating effect the knifing operation may have on pasture stand	Silver Birch Charolais *Bruderheim*	David Wong *Lamont*	2,374
A Comparison of Clearing Methods for Range Improvement in the Central Parklands • to demonstrate range development strategies and the procedures involved in implementing a prescribed burn	C & W Farms *Viking*	Tennis Marx *Ryley*	1,900
Field Pea Variety Testing and Agronomic Study • to demonstrate field pea varieties with different soil and climate conditions	Central Alberta Branch, Pulse Growers Commission *Vermilion*	Neil Miller *Lacombe*	3,993

Project Title and Objective	Principal Cooperator/ *Project Location*	Project Coordinator/ *Office*	Funding Awarded 1990-91
Evaluation of Creep Feeding Systems in Northeast Alberta • to evaluate calf performance and economics of creep feeding protein meal versus grain versus no creep to nursing calves on brome pasture	Bill Trabysh *Hairy Hill*	Pat Ramsey *Vermilion*	2,292
Bacterial Hay Preservative Trial • to demonstrate the use of a bacterial hay preservative	Bill Gibson *Smoky Lake*	Don Christensen *Smoky Lake*	295
Alfalfa versus Cereal Silage In Backgrounding Feedlot Feeding Trial • to evaluate cereal silage versus alfalfa in relation to cattle performance and the economics of an end product (backgrounded fall calves)	Riverside Stock Farms *Willingdon*	Don Christensen *Smoky Lake*	8,600
Farm Family Expenditures • to demonstrate separate farm business and family/household record keeping procedures	Christine Fletcher *Smoky Lake*	Edith Zawadiuk *Two Hills*	2,312
REGION V - NORTHWEST ALBERTA			
Costs of Pasturing Cow/Calf Pairs in North Central Alberta • to collect information on the costs of pasturing cows and calves under various management regimes	Pembina Forage Association *Westlock*	Rod Carlyon *Westlock*	15,160
Sclerotinia Control Using Ground and Aerial Application at Recommended Rates of Fungicide and Split Application • to test different types of fungicide applications and monitor levels of sclerotinia	ProGrow Canola Club *Fort Saskatchewan*	Bill Chapman *Barrhead*	13,580
Barley Variety Evaluation and Soil Temperature Monitoring on Peat Soils • to evaluate the thermal properties of deep plowed and layered peat soils at three depths	North West Peat Soils Group *Barrhead*	Bill Chapman *Barrhead*	7,000
Golden Glow Backflooding Irrigation Project • to demonstrate the benefits of utilizing excess snow melt and to increase forage yields by using spring flood irrigation	Marvin Pohl *Millet*	Elmer Bittner *Leduc*	1,000
Elevated Reservoir Cattle Watering System • to show a practical alternative method of watering cattle from a dugout	Pembina Forage Association *Westlock*	Bob Buchanan *Barrhead*	1,732
Phosphorus Fertility on Field Peas • to assess the effect of phosphorus on Tipu field peas	Harold Pfeiffer *Westlock*	Rod Carlyon *Westlock*	1,785
Vertical Nuc Wintering Program Demonstrating Production Techniques, Winter Viability and Economic Analysis • to demonstrate the vertical nuclei system for disease control, increased manageability and self-sufficiency of beehives	Honeybear Apiaries *Rollyview*	Roger Andreiuk *Leduc*	4,750
Solar Powered Watering System for Cattle on Pasture • to demonstrate the pumping of water from a dugout using a solar powered water pumping system	Pembina Forage Association *Westlock*	Bob Buchanan *Barrhead*	5,991
Agronomics of Field Peas and Fababeans in North Central Alberta • to test and demonstrate promising new varieties of field peas and fababeans under local growing conditions	Northern Branch, Pulse Growers Commission *Westlock*	John Hladky *Morinville*	18,200
Oat Variety Fertility Evaluation Trial • to evaluate currently grown oat varieties under various fertility and management levels	Oat Producers Association of Alberta *Barrhead*	Bill Chapman *Barrhead*	17,175
Field Pea Creep Ration for Fall Born Calves • to demonstrate the benefits of feeding field pea versus whole oat creep to fall born calves	Bill Lee *Camp Creek*	Rob Hand *Barrhead*	2,287
Effects of Dehorning and/or Castrating Suckling Beef Calves • to demonstrate the benefits in animal performance of dehorning and/or castrating calves at birth and after sixty days	North West Cattle Feeders *Stony Plain*	Rob Hand *Barrhead*	8,625
Farm Family Expenditures • to demonstrate separate farm business and family/household record keeping procedures	Cathy Wegner *Duffield*	Randi Sandbu *Barrhead*	4,020

Project Title and Objective	Principal Cooperator/ *Project Location*	Project Coordinator/ *Office*	Funding Awarded 1990-91
REGION VI - PEACE RIVER			
Soil Conservation and Rehabilitation Through Minimum Tillage in a Continuous Cropping System • to demonstrate minimum tillage using a new seed drill model	Ron Molson *Bonanza*	Garry Coy *Fairview*	10,900
Zero and Minimum Tillage in Continuous Cropping • to compare conventional and conservation tillage systems for continuous cropping	Smoky Applied Research and Demonstration Association *Falher*	Hector Goudreau *Falher*	4,400
Maximizing Pasture Use by Increased Production and Extension of the Grazing Season • to assess various grass species for early spring and late fall grazing	Norman Hollingworth *Sexsmith*	Mark Olsen *Fairview*	4,653
Effects of Liquid Hog Manure Application in a Cereal and Oilseed Cropping Rotation • to assess the value of manure through crop response and long-term soil effects	Carnie Morrill *Bonanza*	Garry Coy *Fairview*	800
Eradication of Ovine Progressive Pneumonia in Finnish Landrace Sheep • to demonstrate control of ovine progressive pneumonia (OPP) in Finnish Landrace sheep by semi-annual testing and culling	Ken and Morag Othen *Blueberry Mountain*	Dr. Jim Henderson *Fairview*	6,393
Utilization of a Refrigeration System for Indoor Wintering of Honeybee Nucleus Colonies • to successfully overwinter nucleus colonies headed by a young mated queen	North Star Honey Co. Ltd. *Manning*	Doug Colter *Falher*	1,299
Economics of High Rates of Nitrogen Application on Pasture • to assess the economic feasibility of single or split high rate applications of nitrogen on pasture	John Connelly *Elmworth*	Paul Laflamme *Grande Prairie*	2,380
Crop and Soil Monitoring at Subsoiled Sites in the Municipal District of Smoky River (#130) • to assess the efficacy of subsoiling with and without amendments	Smoky Applied Research and Demonstration Association *Falher*	Garry Coy *Fairview*	3,800
Shelter Designs for Leafcutting Bees in the Peace River Region • to test several shelter designs for leafcutting bees	Alberta Alfalfa Seed Producers Association *Peace River*	Dave Spencer *Peace River*	10,000
Comparative Study of Red Angus and Gelbvieh Sires' Offspring Using Alberta Agriculture's Cattle Improvement Program • to demonstrate the Cattle Improvement Program (CIP) cow/calf management package as a tool to shorten the calving period and to maximize beef herd profits	Bar GR Cattle *High Prairie*	Kimber Mader *High Prairie*	1,181
Canola Productivity Centre Pilot Project • to demonstrate improved agronomic practices in the production of canola with increased protein and oil content, and higher yield	Mark Reed *Grand Prairie*	Paul Laflamme *Grande Prairie*	9,923
Farm Family Expenditures • to demonstrate separate farm business and family/household record keeping procedures	Mary Janzen *La Crete*	Leona Skulmoski *Falher*	3,237
Bumblebees and Leafcutter Bees to Pollinate Alfalfa in the Peace River Region • to demonstrate the importance of maintaining habitat to encourage native bumblebee and leafcutter bee pollination of alfalfa seed fields	Raymond Wood *Peace River*	Dave Spencer *Peace River*	10,000

On-Farm Demonstration Project Sites

Statistical Tables

Distribution of Research Program Projects and Estimated Funding by Institution **1990-91**

Institution	Number of New Projects	Number of Renewed Projects	Funding Awarded	Percent of Total Awarded
Agriculture Canada	15	19	$1,498,000	37.4
Alberta Agriculture	5	9	512,500	12.8
Alberta Environment	2	–	42,000	1.0
Private Industry	4	4	241,000	6.0
University of Alberta	23	23	1,529,500	38.2
University of Calgary	–	1	25,000	0.6
Western College of Veterinary Medicine	2	–	25,000	0.6
Veterinary Infectious Disease Organization	2	1	129,000	3.2
TOTAL	53	57	$4,002,000	

Distribution of Research Program Projects and Estimated Funding by Program Area **1990-91**

Program Area	Number of New Projects	Number of Renewed Projects	Funding Awarded	Percent of Total Awarded
Cereals and Oilseeds	2	8	$646,000	16.1
Forages	3	3	214,000	5.3
Special Crops	2	5	209,500	5.2
Crop Protection and Entomology	9	7	667,000	16.7
Land Resources and Engineering	2	12	482,000	12.0
Irrigation	2	1	98,000	2.4
Ruminant Livestock	14	7	776,500	19.4
Non-Ruminant Livestock	5	6	333,000	8.3
Processing and Marketing	14	8	576,000	14.4
TOTAL	53	57	$4,002,000	

Distribution of On-Farm Demonstration Program Projects and Estimated Funding by Region

	1989-90			1990-91		
Region	Number of New Projects	Number of Renewed Projects	Funding Awarded	Number of New Projects	Number of Renewed Projects	Funding Awarded
Region I – Southern Alberta	10	4	$113,050	6	7	$121,353
Region II – South Central Alberta	7	17	72,073	14	7	71,562
Region III – North Central Alberta	18	12	110,215	20	5	82,229
Region IV – Northeast Alberta	13	12	69,433	3	9	35,376
Region V – Northwest Alberta	17	1	97,551	8	5	101,305
Region VI – Peace River	21	12	118,509	3	10	68,966
TOTAL	86	58	$580,831	54	43	$480,791

Distribution of Research Program Projects and Estimated Funding by Year

Year	New Projects		Renewed Projects		Total	
	Number	Funding	Number	Funding	Number	Funding
1979-80	54	$2,133,680	–	$ –	54	$2,133,680
1980-81	31	980,465	51	2,210,642	82	3,191,107
1981-82	26	796,915	80	3,281,402	106	4,078,317
1982-83	39	2,017,500	101	4,116,911	140	6,134,411
1983-84	48	1,564,675	94	4,977,785	142	6,542,460
1984-85	101	4,343,769	–	–	101	4,343,769
1985-86	38	1,513,079	65	3,309,988	103	4,823,067
1986-87	37	1,533,870	58	3,063,542	95	4,597,412
1987-88	86	3,811,183	–	–	86	3,811,183
1988-89	53	1,744,000	46	2,144,000	99	3,858,000
1989-90	36	1,267,000	65	2,672,000	101	3,939,000
1990-91	53	1,700,000	57	2,302,000	110	4,002,000
TOTAL	602					$51,454,406

Distribution of On-Farm Demonstration Program Projects and Estimated Funding by Year

Year	New Projects		Renewed Projects		Total	
	Number	Funding	Number	Funding	Number	Funding
1982-83	47	$163,194	–	$ –	47	$163,194
1983-84	60	227,846	14	75,336	74	303,182
1984-85	80	226,940	25	93,944	105	320,884
1985-86	92	248,149	29	110,020	121	358,170
1986-87	108	342,044	31	125,102	139	467,146
1987-88	96	383,162	41	158,174	137	541,336
1988-89	114	353,935	54	239,240	168	593,175
1989-90	86	394,724	58	186,107	144	580,832
1990-91	54	256,625	43	224,163	97	480,788
TOTAL	737					$3,808,707

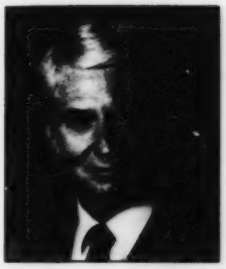
Summary Schedule of Research Awards, by Institution

For the Year Ended March 31, 1991

	1990-91	1989-90
Educational Institutions:		
The University of Alberta	$1,529,500	$1,413,000
The University of Calgary	25,000	24,000
Western College of Veterinary Medicine	25,000	164,000
	1,579,500	1,616,000
Government Organizations:		
Agriculture Canada:		
Beaverlodge	$ 195,000	$ 288,000
Lacombe	313,000	290,000
Lethbridge	886,000	820,000
Saskatoon	25,000	80,000
Vancouver	79,000	85,000
	1,498,000	1,563,000
Alberta Agriculture	512,500	416,000
Alberta Environment	42,000	76,000
	2,052,500	2,055,000
Private Sector Organizations:		
Agritrends Economic Research Inc	$ 36,000	$ 40,000
Animal Research International	36,000	–
Ashmead Economic Research Inc	14,000	–
Feedlot Health Management Services	50,000	–
Griffiths & Griffiths Ecological Consultants	33,000	35,000
Lambda Technology Ltd	48,000	–
Norwest Soil Research Ltd	24,000	67,000
Veterinary Infectious Disease Organization	129,000	38,000
	370,000	268,000
	$4,002,000	$3,939,000

Farming For The Future Council

Members



Mr. H.B. McEwen
Deputy Minister
Alberta Agriculture
Chairman

Dr. R.G. Christian
Executive Director
Research Division
Alberta Agriculture

Dr. D.J. Currie
Vice-President
Alberta Research
Council

Mr. Jim Hole
Producer
St. Albert

Mr. Murray Holt
Producer
Sangudo

Mr. Ty Lund
MLA
Rocky Mountain
House

Mr. John Prentice
Producer
Calmar

Mr. Ben Schrader
Producer
Jarvie

Dr. Bernie Sonntag
Director
Agriculture Canada
Research Station –
Lethbridge

Dr. Yilma Teklemariam
Research Manager
Research Division
Secretary

Dr. Ed Tyrchniewicz
Dean, Faculty of
Agriculture and
Forestry
University of Alberta

Research Program Committees

Program Area	Cereals and Oilseeds	Crop Protection and Entomology	Forages
Chairman	Vacant	Vacant	Mr. Murray Holt , *Sangudo* Producer
Vice-Chairman	Mr. Don Macyk, *Edmonton* Alberta Agriculture	Mr. Keith Price, *Edmonton* Alberta Agriculture	Mr. Robert Nelson, *Lacombe* Alberta Agriculture
Members	Mr. Kenneth Appleby, *Tofield* Producer	Mr. Daniel Groenenboom, *Kipp* Producer	Dr. Vern Baron, *Lacombe* Agriculture Canada
	Dr. Keith Briggs, *Edmonton* University of Alberta	Mr. Ken Nelson, *Stettler* Producer	Mr. Bob Grinde, *Rimbey* Producer
	Mr. Robert Graham, *Olds* Producer	Dr. John Spence, *Edmonton* University of Alberta	Dr. Jane King, *Edmonton* University of Alberta
	Mr. Michael Lavoie, *St. Isidore* Producer	Dr. Dean Struble, *Lethbridge* Agriculture Canada	Mr. Keith Lyseng, *Armena* Producer
	Mr. Lynn Thacker, *Bow Island* Producer		Mr. Roger Marvin, *Edmonton* Alberta Forestry, Lands & Wildlife
	Dr. Don Woods, *Beaverlodge* Agriculture Canada		Mr. Paul Sorenson, *Berwyn* Producer
			Mr. Norm Ward, *Granum* Producer

Program Area	Irrigation	Land Resources and Engineering	Non-Ruminant Livestock
Chairman	Mr. John Weing, *McGrath* Producer	Vacant	Mr. John Prentice, *Calmar* Producer
Vice-Chairman	Mr. Gerhardt Hartman, *Lethbridge* Irrigation Secretariat	Mr. Brent Paterson, *Lethbridge* Alberta Agriculture	Dr. Terry Church, *Edmonton* Alberta Agriculture
Members	Mr. Brian Colgan, *Edmonton* Alberta Agriculture	Dr. David Chanasyk, *Edmonton* University of Alberta	Mr. Don Gregorwich, *Kelsey* Producer
	Mr. John Hollinda, *Tilley* Producer	Mr. Mike Franchuk, *Smoky Lake* Producer	Dr. Don Hamilton, *Saskatoon* Western College of Veterinary Medicine
	Mr. Simon Jensen, *Standard* Producer	Dr. Henry Janzen, *Lethbridge* Agriculture Canada	Mr.Manfred Kanehl, *Stony Plain* Producer
	Mr. Jake Thiessen, *Edmonton* Alberta Environment	Mr. Ike Lanier, *Lethbridge* Producer	Mr. Peter Klok, *Nobleford* Producer
	Mr. Peter Vanden Dungen, *Vauxhall* Producer	Dr. Stephen Moran, *Edmonton* Alberta Research Council	Dr. Allan Schaefer, *Lacombe* Agriculture Canada
	Mr. Paul VanTryp, *Burdett* Producer	Mr. Fred Pewarchuk, *Lamont* Producer	Dr. Jeong Sim, *Edmonton* University of Alberta
	Mr. Hans Visser, *Taber* Producer	Mr. Bill Woytenko, *Thorhild* Producer	
	Mr. Richard Williams, *Wardlow* Producer		

Program Area	Processing and Marketing	Ruminant Livestock	Special Crops
Chairman	Mr. Ty Lund, *Rocky Mountain House* Producer and MLA	Mr. Ben Schrader, *Jarvie* Producer	Mr. Jim Hole, *St. Albert* Producer
Vice-Chairman	Mr. Les Lyster, *Edmonton* Alberta Agriculture	Mr. Ron Weissenburger, *Edmonton* Alberta Agriculture	Mr. Thomas Krahn, *Brooks* Alberta Agriculture
Members	Dr. Stewart Campbell, *Lethbridge* Agritrends Research Inc.	Dr. Glenn Coulter, *Lethbridge* Agriculture Canada	Dr. Dermot Lynch, *Lethbridge* Agriculture Canada
	Dr. Brian Freeze, *Lethbridge* Agriculture Canada	Mr. John DeLeeuw, *Carrot Creek* Producer	Dr. Raj Nagarajan, *Edmonton* Alberta Research Council
	Dr. Michael Stiles, *Edmonton* University of Alberta	Dr. Cecil Doige, *Saskatoon* Western College of Veterinary Medicine	Mr. G[illegible] Perry, *Cranford* Producer
	Mr. John Stokalko, *Sherwood Park* Private Sector	Mr. Francis Gardner, *Nanton* Producer	Mr. Robert Sproule, *Sherwood Park* Salisbury Greenhouses
	Dr. Terrence Veeman, *Edmonton* University of Alberta	Dr. John Kennelly, *Edmonton* University of Alberta	Dr. J.P Tewari, *Edmonton* University of Alberta
		Mr. Murray Stauffer, *Eckville* Producer	Mr. Jerry Thacker, *Burdett* Producer

On-Farm Demonstration Program Committees

Region **I. Southern**

Chairman Mr. Don Young, *Lethbridge*

Members

Producers
Mr. Murray Markert, *Vulcan*
Mr. Buck Spencer, *Nobleford*
Mr. Steve Slemko, *Coaldale*
Mr. Frank Spanbauer, *Barnwell*
Mr. Will Van Roessel, *Bow Island*

Alberta Agriculture Staff
Mr. Gordon Frank, *Brooks*
Mr. E. Alan George, *Lethbridge*
Mr. Blair Shaw, *Lethbridge*

Region **II. South Central**

Chairman Mr. Glen Werner, *Airdrie*

Members

Producers
Mr. Del Bates, *Acme*
Mr. Lindsay Eklund, *Cochrane*
Mr. Arthur Jaques, *Oyen*
Mr. William Noy, *Rosebud*

Alberta Agriculture Staff
Mr. Ted Darling, *Airdrie*
Mr. Donald Milligan, *Airdrie*
Mr. Richard Smith, *Airdrie*
Mr. Larry Welsh, *Airdrie*

Region **III. North Central**

Chairman Mr. Alan Hall, *Red Deer*

Members

Producers
Ms. Joyce Bussard, *Wetaskiwin*
Mr. Terry Crisp, *Monitor*
Mr. Al Chiswell, *Lacombe*
Mr. Ken Nelson, *Stettler*

Alberta Agriculture Staff
Mr. Wayne Jackson, *Red Deer*

Region **IV. Northeast**

Chairman Mr. Ralph Berkan, *Vermilion*

Members

Producers
Mr. Steve Blashko, *Andrew*
Mr. Clement Fontaine, *St. Paul*
Mr. Robert Schacher, *Tofield*

Alberta Agriculture Staff
Mr. Shane Dobson, *Two Hills*
Ms. Tennis Marx, *Ryley*
Mr. Ellis Treffry, *Vermilion*
Ms. Edith Zawadiuk, *Two Hills*

Region **V. Northwest**

Chairman Mr. John Tackaberry, *Barrhead*
**Acting Chairman* Ms. Randi Sandbu, *Barrhead*

Members

Producers
Mr. Dale Greig, *Barrhead*
Mr. Eric Karlzen, *Carrot Creek*
Mr. Robert Stannard, *Sherwood Park*
Mr. Garry Webber, *Stony Plain*
Mr. Fred Witney, *Boyle*

Alberta Agriculture Staff
Mr. William Chapman, *Barrhead*
Mr. Robert Winchell, *Barrhead*
Mr. Wayne Winchell, *Barrhead*

*Effective Febuary 1991

Region **VI. Peace River**

Chairman Mr. John Knapp, *Fairview*

Members

Producers
Mr. Alan Barnes, *Enilda*
Mr. Eugene Dextrase, *High Level*
Mr. Dave Hegland, *Wembley*
Ms. Gertie Sorenson, *Bezanson*
Mr. Tony Yelenik, *Valleyview*

Alberta Agriculture Staff
Ms. Linda Hauk, *Spirit River*
Mr. Mike Pearson, *Eaglesham*
Mr. Mike Rudakewich, *Fairview*